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A NEW METHOD
WITH
GEOGRAPHY
BY
J. H. DIEBEL, A. M.



Class G129

Book 16

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A NEW METHOD
WITH
GEOGRAPHY

ILLUSTRATING THE USE OF THE
SKETCH-MAP,

BY
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11

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ARITHMETIC BY ANALYSIS, NEW METHOD WITH
U. S. HISTORY, ETC.

COLUMBUS, OHIO

THIRTY-THIRD THOUSAND

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PREFACE.

THERE has, in recent years, been much discussion on the subject of map-drawing, as an aid in the study of Geography; and, while many good teachers strongly advocate it, some equally good teachers as strongly oppose it. The opposition is founded mainly on the fact that it takes up too much valuable time. And, who will say that this objection is not well taken? Pupils have been encouraged to spend weeks in the mechanical construction of maps into whose real meaning and relative proportions they took but little trouble to inquire, but rather spent their time in tracing outlines and coloring surfaces according to some model (usually the map in the book) which lay before them. This mechanical accuracy of copying is, in itself, not a bad thing, but it does not develop the faculty of location nor teach the pupil anything about Geography. To draw maps according to some cartographic diagram, or design, is to defeat the object intended to be gained, and hence, many of our best teachers have warred against map-drawing.

THE SKETCHING of maps from memory at once sets aside these objections and retains all that is favorable. This exercise when rightly conducted is a most valuable aid, and the following lessons have been arranged to assist teachers and pupils in its execution. The pupils should take their places at the black-board, and at the direction of the teacher draw the boundary lines—drawing the same lines at the same time. In this way the outline may be discussed and criticised at different points and its accuracy determined from their memory of positions and relative proportions. Mountains, rivers and lakes should then be sketched, and discussed as to their location, trend, and extent. The capitals and other important cities should then be located. After a time the pupils will be able to work more independently. In the lessons that follow the sketches have been placed at the head mainly for comparison while the pupil studies his lesson from the outline that appears on the op-

posite page, but the drawing should not be made by the class until the lesson has been studied. Under each map a number of questions have been placed to furnish a drill in the construction of the sketch. Many others will suggest themselves.

THE TOPICAL OUTLINES will be found useful to those who employ the topical method of recitations,—and we believe there is no better method,—yet it needs to be supplemented, for no “*method*” can be really conclusive in itself. Details must be brought out by discussion, and items of special interest must be suggested by such questions as may be found in the supplements which follow these lessons.

This little work is merely intended as an aid and guide in the study of Geography, and to furnish models for systematic work in this interesting, though often badly taught, study.

The model for Ohio with a few slight changes will answer for any state; that of New England for any physical division; that of the United States for any country; and so forth. The writer has much confidence in the practical utility of this method of teaching Geography, and hopes that his fellow teachers may find time to examine it, and that some, at least, may derive assistance and benefit therefrom.

J. H. D.

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LESSON I.

TOPICAL OUTLINE DEVELOPING DEFINITIONS AND CLASSIFICATIONS.

I. Mathematical Geography.

1. Form of the Earth.

2. Size of the Earth.

- { 1. Area; 2. Circumference;
- 3. Diameter;
- 1. Polar; 2. Equatorial.

3. Position in the Solar System.

- { 1. Distance from the Sun;
- 2. Inclination of the Axis;
- 3. Plane of the Ecliptic.

4. Circles and Measurements.

- { 1. Great Circles;
- 1. Equator; 2. Meridians.
- 2. Small Circles;
- 1. Parallels; 2. Tropics; 3. Polars.
- 3. Zones;
- 1. Torrid; 2. Temperate; 3. Frigid.
- 4. Latitude and Longitude.

5. Motions of the Earth.

- { 1. Diurnal; 2. Annual;
- 3. Parallelism of Axis;
- 4. Points of the Orbit;
- 1. Equinoxes; 2. Solstices;
- 3. Perihelion; 4. Aphelion.
- 5. Change of Season.

II. Physical Geography.

1. Divisions of Land.

- { 1. Continent;
- 2. Island;
- 1. Continental; 2. Oceanic.
- 3. Special Forms;
- 1. Peninsula; 2. Isthmus; 3. Cape.

2. Surface.

- 1. Highlands;
 - 1. Mountain;
 - 1. System; 2. Range; 3. Peak.
 - 2. Volcano;
 - 1. Active; 2. Extinct.
 - 3. Plateau; 4. Desert; 5. Watershed.
- 2. Lowlands;
 - 1. Plain; 2. Basin; 3. Valley.

3. Divisions of Water.

- 1. Oceans;
 - 1. Sea; 2. Gulf; 3. Bay;
 - 4. Channel; 5. Sound; 6. Strait.
- 2. Inland Waters;
 - 1. River;
 - 1. System; 2. Estuary; 3. Delta.
 - 2. Lake;
 - 1. Fresh; 2. Salt.
 - 3. Marsh; 4. Tundra.

4. Atmosphere.

- 1. Temperature; 2. Isothermal Lines;
- 3. Wind;
 - 1. Constant; 2. Periodic; 3. Storm.
- 4. Climate;
 - 1. Continental; 2. Insular.

III. Political Geography.**1. Political Division.****2. Government.****3. Inhabitants.**

- 1. Manner of Living;
 - 1. Civilized; 2. Barbarous.
- 2. Occupations;
 - 1. Agriculture; 2. Mining;
 - 3. Manufacturing; 4. Commerce.
- 3. Religions;
 - 1. Theism; 2. Paganism.
- 4. Languages;
 - 1. Original; 2. Dialect.

SUPPLEMENTARY.

QUESTIONS.

1. How many planets are there in the solar system?
2. How many moons accompany these planets?
3. Are there any other bodies in the solar system?
4. What are shooting stars? What are comets?
5. Is there any danger of collision with a comet?
6. Who first taught that the earth was in motion?
7. What was the extent of the primeval ocean?
8. What causes eclipses of the sun and moon?
9. Will Polaris (pole-star) always be our north star?
10. Which is the longer, summer or winter?
11. Did water always exist on the surface of the earth?
12. Was the water of the ocean always salty?
13. What is the oldest land in the world?
14. How were mountains and valleys formed?
15. What is the fable of "Atlantis?"
16. The earth is growing. Can you explain this?
17. Does the burning of coal make the earth lighter?
18. What idea did the ancients have regarding the shape, situation and "foundation" of the earth?

ANSWERS.

1. There are eight planets in the solar system. They are placed at regular intervals from the sun, except that there is a gap between Mars and Jupiter where no planet is found, but instead a number of little planetoids.

2. There are twenty-one, distributed as follows:
Earth, one; Mars, two; Jupiter, five; Saturn, eight; Uranus, four; Neptune, one.

3. The solar system contains myriads of other bodies all of which travel around the sun in paths of their own. Some are collected in "swarms" while others travel alone.

4. When these little bodies come in collision with the earth they are ignited by friction while passing through the atmosphere and are called *shooting stars*. Comets are those celestial objects which appear in the sky accompanied by a train, or "tail." Their composition is not well understood.

5. There is not much danger of a collision; yet such a thing might happen.

6. Pythagoras, a Grecian philosopher.

7. No doubt at one time the ocean covered the entire earth. As the interior of the earth cooled it contracted, and the crust being *too large*, sank in some places and rose above the water in others, forming continents and islands.

8. When the moon comes exactly between the earth and the sun, the sun is eclipsed. When the moon is on the opposite side, it passes into the earth's shadow and is eclipsed.

9. It will not. The earth's axis is constantly changing its direction—describing a circle in the heavens 47° in diameter. In 26000 years Polaris will again be our north star.

10. In the northern hemisphere summer is several days longer than winter, since that part of the orbit over which the earth travels in summer is longer than the other; and also the earth moves slowest when farthest from the sun.

11. When the earth was yet very hot the water was in the form of vapor, and floated in the atmosphere as immense clouds. Water becomes vapor at 212° Fahr.

12. When water first fell upon the earth it was *fresh*. As it wore away the crust it dissolved the salt and held it in solution. Every stream carries salt to the ocean.

13. It seems quite certain that the first land which rose out of the primeval ocean was that portion of Canada known as the Height of Land.

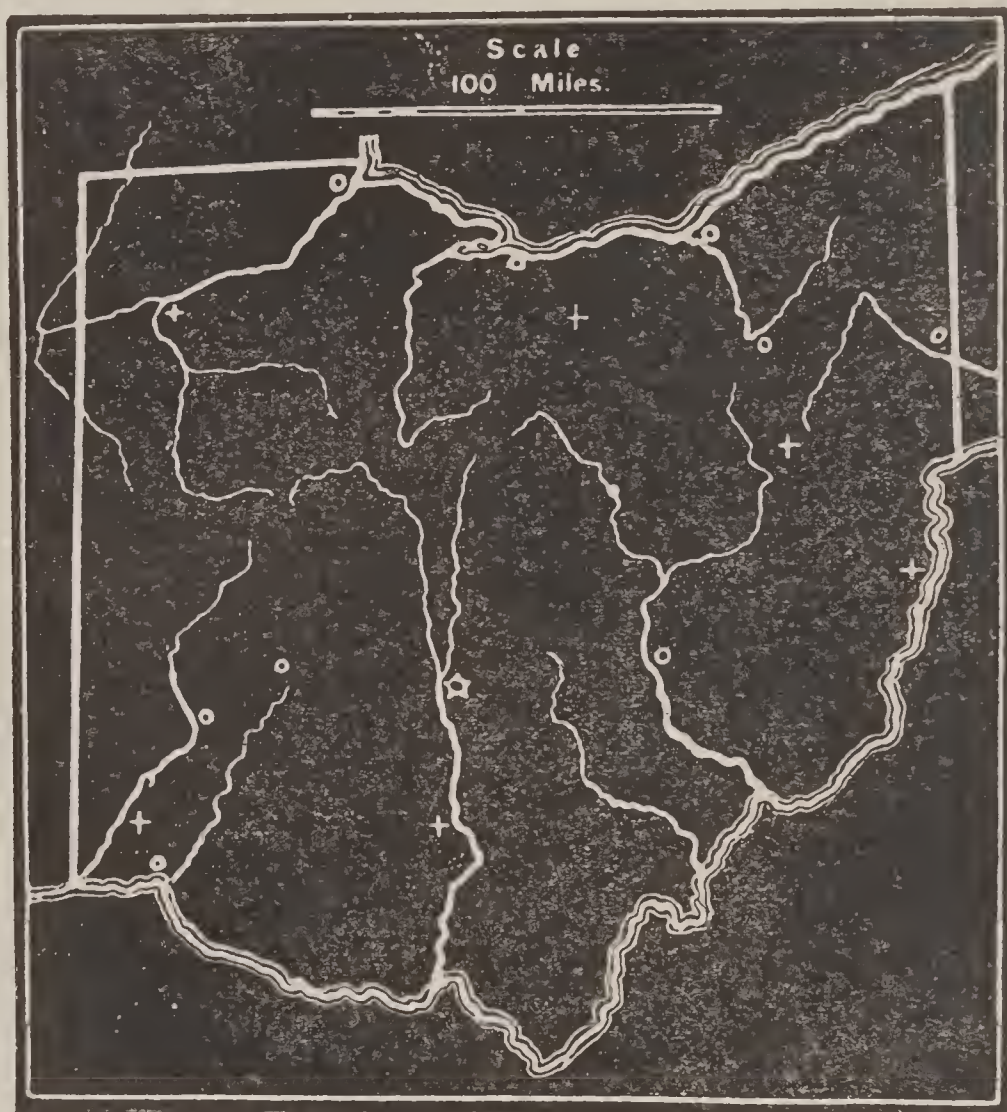
14. The crust in adjusting itself to the contracted interior, as above mentioned, became wrinkled into ridges and valleys. In some places it broke and formed mountains.

15. There is a very old tradition that there was at one time an island in the Atlantic ocean which at some remote time sank below its waters. Plato called it "Atlantis."

16. As the earth flies through space myriads of little lodies(aërolites, etc.,) are constantly falling upon its surface. About 100 tons of matter fall upon the earth every day.

17. It does not. When a substance is burned the ashes which remain and the gas which escapes weigh exactly as much as the substance burned.

18. The Greeks, at an early period, believed that the earth was a globe supported on the shoulders of the giant, Atlas. The Chinese thought that it was flat, and was held in place by immense pillars. The Hindoos believed that it was a hemisphere, and was supported by four elephants standing upon the back of a great tortoise.

LESSON II.**OHIO.****MAP-DRILL ON CONSTRUCTION.**

1. Where must a line be drawn which measures the greatest north-and-south distance in the state? 2. How long is this line? (Measure with scale in map.) 3. Measure the greatest east-and-west distance. 4. Is this line of the same length as its parallel which passes through Sandusky? Why? 5. Where is the water-shed in this state? 6. If a straight line be drawn to indicate it, where would it intersect the western boundary? 7. Name the cities whose location is marked in the map. 8. How far is each of the three largest cities from the capital?

NOTES.—1. These lessons are intended merely as models. The class should always begin with its native state, and sketch as many of the other states as the time allotted to the study of Geography may permit.

2. The teacher and pupils are requested to read carefully the preface in order that the plan and intent of these lessons may be more fully understood.

TOPICAL OUTLINE.

1. Position.

- { 1. Boundary;
- { 2. Latitude and Longitude.

2. Area.

- { 1. Absolute; (In square miles.)
- { 2. Relative. (Compared with other States.)

3. Surface.

- { 1. Northern Plain;
- { 2. Central Table-land;^{11*}
- { 3. Marsh Regions;⁷
- { 4. Hills and Valleys;
- { 5. Soil.

4. Coast Line.

- 1. Extent; 2. Indentations; 3. Harbors.

5. Rivers and Lakes.

- { 1. Rivers flowing into the Ohio;
- { 2. Rivers flowing into Lake Erie;
- { 3. Lake Erie;
- { 4. Artificial Lakes.¹⁰

6. Climate.

- 1. Temperature; 2. Moisture; 3. Winds.

7. Productions.

- { 1. Vegetables; 2. Minerals;
- { 3. Animals; 4. Manufactures.

8. Occupations.

- { 1. Agriculture; 2. Mining;
- { 3. Manufacturing; 4. Commerce.

9. Important Cities.

- { 1. Capital; 2. Metropolis;
- { 3. Other cities.

10. History.

- 1. Settlement;⁵ 2. Admission.¹³

11. Natural Curiosities.⁸

*These figures refer to supplementary questions.

SUPPLEMENTARY.

QUESTIONS.

1. What is the motto of Ohio?
2. Who first visited this region?
3. Name the cities that have been the capital?
4. What noted Indian tribes formerly lived here?
5. Describe the first permanent settlement.
6. When and where was the first railroad built?
7. What part of the State was originally marshy?
8. Name some natural curiosities found in the State?
9. Where is the oil region?
10. What artificial lakes are found in the State?
11. What and where are the barrens?
12. Name some of the original wild animals.
13. When was Ohio admitted into the Union?
14. Who was the first Governor?
15. What and where is the National Road?
16. What is the supposed origin of the "terraces"?

ANSWERS.

1. "Imperium in Imperio," is the motto of Ohio, and means, an empire in an empire.

2. It is thought LaSalle explored this region about the year 1680. He was probably the first white visitor.

3. Chillicothe, Zanesville, Chillicothe and Columbus have been the capitals of the State in the order named.

4. The Eries, along the shore of the lake; the Hurons, in the northwestern part, and the Delawares, in the Muskingum valley. About the year 1650, the Eries were conquered and expelled by the Iroquois.

5. The first permanent settlement was made at the mouth of the Muskingum in 1788. It was called Marietta in honor of Marie Antoinette, queen of Louis XVI.

6. The first railroad was built in 1835, along the Mad river, and was called the *Mad River Road*.

7. There was a large marsh, called the Black Swamp, in the northwestern part, which included the larger part of Wood county. This is now in a high state of cultivation.

8. The ancient mounds in the southern part, the pure water fountains in the northwestern, and the mineral springs

in Greene, Seneca, and Delaware counties, are the most noted of natural curiosities.

9. Wood county and vicinity is one of the richest oil fields in the world. The wells are about 1,200 feet deep.

10. In Mercer, Auglaize and Shelby counties, there is a number of large reservoirs, which are used as feeders of canals. St. Mary's, one of these, is the largest artificial lake in the world.

11. In the central part of the State are large tracts of prairie. Those which are considerably elevated were formerly thought to be unfit for cultivation and were called *barrens*. Some of these "barrens" have been found to be among the richest farming land in Ohio.

12. The bear, deer, fox, wild cat, opossum, raccoon, rabbit, squirrel, mink and beaver.

13. There has been much dispute as to whether it was admitted in 1802, or in 1803. In the year 1802, Congress approved the laws enacted by the governor and judges of the territory, and a convention which assembled at Chillicothe, framed a State constitution. But recent investigations seemed to prove, beyond a doubt, that it was not considered a *state* until February, 1803.

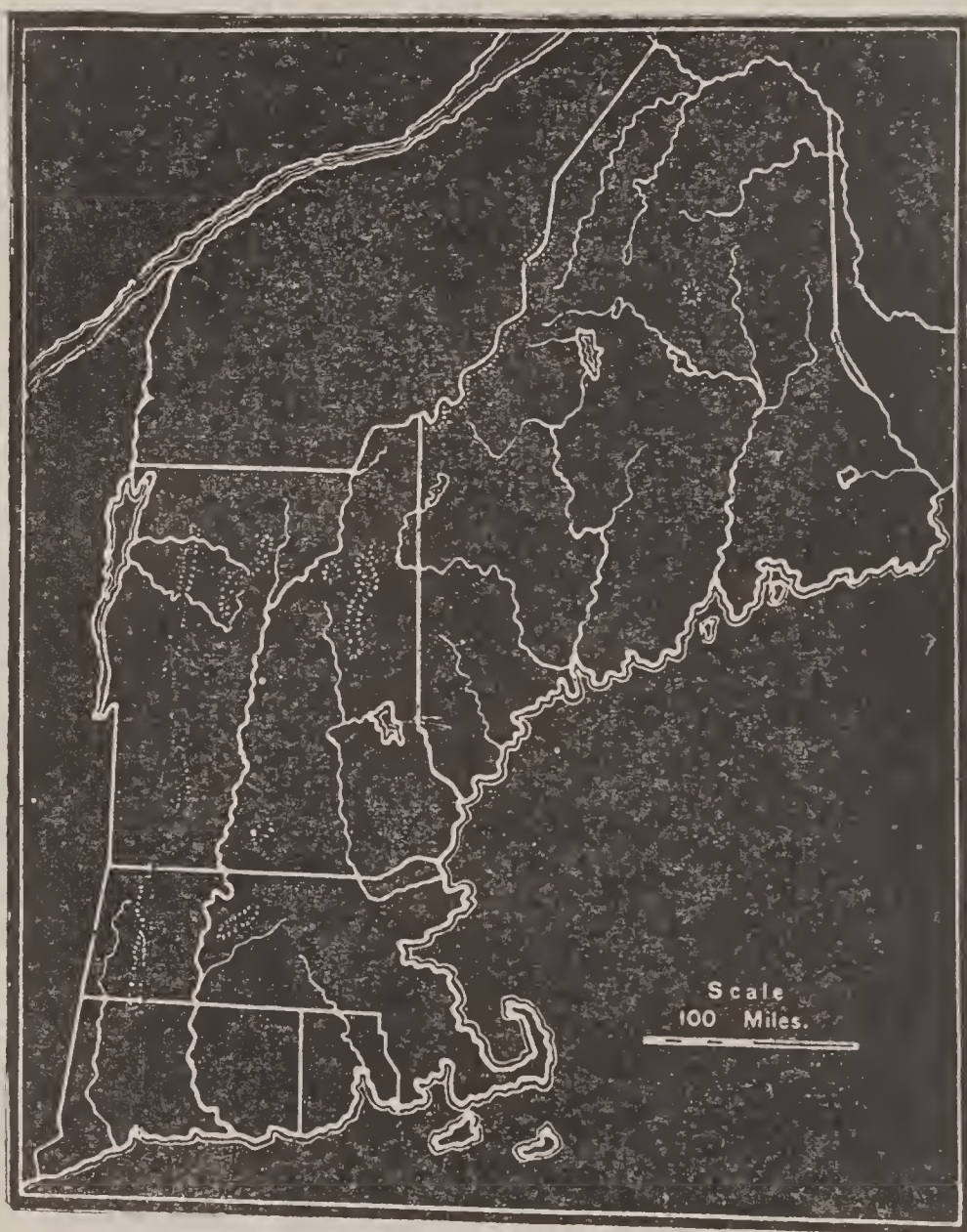
14. Edward Tiffin was the first Governor of Ohio as a state; Arthur St. Clair was the first Governor of Ohio as a territory. Cincinnati was the territorial capital.

15. The *national road* was built by the government as a stage-coach road. This turnpike began at Cumberland, Md.; crossed the Ohio at Wheeling, and was intended to be run indefinitely westward as the country became settled. After passing the Ohio, it continues its westward course, and crosses the Indiana boundary near New Paris. It was well built; fine stone bridges span the streams; but, the introduction of the locomotive proved its ruin.

16. In the northern half of the state there is a number of ridges (terraces) which run parallel to the lake shore. It is quite certain that the lake at one time extended to these banks; and, as it receded, left these landmarks of its former self. It is probable that these shiftings of the lake's shore were due to some changes in the geological formation, and were, therefore, quite sudden.

LESSON III.

NEW ENGLAND STATES.



MAP=DRILL.

1. Does the straight line which separates New Hampshire and Maine run exactly north and south? 2. How long is the Connecticut river? (Measure with scale.) 3. Locate the capital, and largest cities in each State. 4. Measure the distance from Boston to the other capitals. (Always make an estimate of the distance before taking a measurement. This affords an excellent training to the eye, and wonderfully develops the faculty of location.) 5. Indicate the position of lines which measure the greatest north-and-south distances in the several states. 6. Measure, with the scale, the lengths of these lines. 7. Find the greatest east-and-west distances. 8. Name the rivers, lakes, and mountains indicated upon the map.

TOPICAL OUTLINE.

1. **Position.**
 - { 1. Boundaries;
 - { 2. Latitude and Longitude.
2. **Area.**
 - { 1. Absolute;
 - { 2. Relative size of States.
3. **Surface.**
 - { 1. Low-Land Plains;
 - { 2. High-Land Plains;
 - { 3. Mountains;
 - 1. Ranges; 2. Peaks; 3. Valleys.
 - { 4. Soil.
4. **Coast Line.**
 - { 1. Extent; 2. Indentations; 3. Harbors.
 - { 4. Projections; 5. Islands.
5. **Rivers and Lakes.**
 - { 1. Rivers flowing into the Atlantic;
 - { 2. Rivers flowing into Lake Champlain;
 - { 3. Interior Lakes;
 - { 4. Border Lakes.
6. **Climate.**
 - 1. Temperature; 2. Moisture; 3. Winds.
7. **Productions.**
 - { 1. Vegetables; 2. Minerals.
 - { 3. Animals; 4. Manufactures.^{3, 8.}
8. **Occupations.**
 - { 1. Agriculture; 2. Manufacturing;^{3, 8.}
 - { 3. Mining; 4. Commerce.
9. **States.**
 - { 1. Positions; 2. Boundaries; 3. Resources.
 - { 4. Important Cities.
 - 1. Capitals; 2. Other Cities.
10. **History.**
 - { 1. Settlements; 2. Indian Wars;
 - { 3. Other Notable Events.¹⁰
11. **Natural Curiosities.**^{5, 7, 14.}

SUPPLEMENTARY.

QUESTIONS

1. Which state is called the "Switzerland of America?"
2. What and where is the Hoosac tunnel?
3. For what are Waterbury and Birmingham noted?
4. Why was Cape Cod so named?
5. What natural curiosity near New Marlborough?
6. What is the origin of the word Yankee?
7. Describe Ice Hill.
8. For what manufactures is Connecticut noted?
9. What popular name is given to each state?
10. Tell of the discoveries by the Northmen.
11. What famous monument in Charlestown?
12. What and where is Dighton Rock?
13. What and where is Hell Gate?
14. What and where are The Notch, Old Man of the Mountain, and The Flume?
15. What is the legend concerning the islands south of Massachusetts?

ANSWERS.

1. New Hampshire is so called on account of its beautiful mountain scenery—resembling that of Switzerland.

2. This is a railway tunnel which penetrates one of the Hoosac ranges in Northwestern Massachusetts. It is nearly five miles long, large enough for two railroad lines, and is the longest tunnel within the United States.

3. Nearly all the pins used in the United States are made in these cities.

4. It was so called on account of the immense shoals of cod fish found in this vicinity.

5. Here is a large boulder weighing about 40 tons, which is so nicely balanced upon a rock foundation that it may be moved with the hand.

6. This word is an imitation of the way the New England Indians pronounced the word "English." It is still used to designate the people of this region.

7. Ice Hill is a deep and narrow gorge in which the ice remains the whole year. The scenery is extremely wild.

8. Connecticut manufactures the greater portion of

the clocks and watches used in the United States, and fully one-half the hardware and rubber goods.

9. Maine is called the Pine Tree State; New Hampshire, the Granite State, also name given above; Vermont, the Green Mountain State; Massachusetts, the Old Bay State; Connecticut, the Land of Steady Habits; and Rhode Island, Little Rhody. (For a complete list of the mottoes and popular names of all the United States, see the author's "New Method with U. S. History.")

10. The New England coast is supposed to have been visited by sea men from Norway and Sweden, in 986. It is thought that one of these, Herjulfson, explored the coast, and another, Lief passed a winter upon the main land in the vicinity of Boston. Lief named the country Good Vineland. His description of the natives, whom he, in contempt, called "Skraelings," tallies very closely with the characteristics of the Esquimos. This has brought on the query, "Did the Esquimos once inhabit New England?"

11. The Bunker Hill monument, erected in commemoration of the battle of that name. It is built of Granite, is 221 feet high, and stands on the spot where Warren fell.

12. This celebrated rock is found on the Taunton river, at Berkeley. There is an inscription upon it which has caused much speculation among learned men. Some think that it was done by the Northmen, and tells of Karlsefne's arrival; others, that it is of still greater antiquity.

13. This is a whirlpool in the western end of Long Island Sound. Sometimes it is very violent.

14. The Notch is a deep gorge, or pass, in one of the ranges of the White Mountains. The Saco passes through it. Old Man of the Mountain is a cliff 1,000 feet high, overlooking a deep gorge. A side view presents a gigantic outline of the human face. The Flume is a narrow opening in a rock, 100 feet deep and only a few feet wide. A tributary of the Pemigewasset flows through it, making a roaring sound. It is frequently called *roaring cavern*.

15. The legend says that these islands were given to three sisters. Elizabeth took the group to which she gave her name; Martha called her island, Martha's Vineyard; then there was but one left and Nan took it (Nantucket).

LESSON IV.

THE EASTERN STATES.

NEW YORK, PENNSYLVANIA, DELAWARE, MARYLAND, NEW
JERSEY, VIRGINIA, WEST VIRGINIA.

[SKETCH and TOPICAL OUTLINE to be made by the pupil.]

SUPPLEMENTARY.

QUESTIONS.

1. What and where is the Natural Bridge?
2. What is known as Mason and Dixon's Line?
3. What lake in New York is tributary to the Gulf of Mexico?
4. What river is called the "Rhine of America?"
5. What and where is "The Triangle?"
6. What are the Palisades?
7. What is the origin of the word Niagara?
8. Where is timber mined? What is its origin?
9. What and where is Cleopatra's Needle?
10. Are the Niagara Falls in the same place that they were a century ago?
11. What is the theory as to the origin of coal?
12. What is the supposed origin of petroleum, and of natural gas?

ANSWERS.

1. The Natural Bridge is a natural arch of rock which spans Cedar creek in Virginia. It is 60 feet wide, and the chasm under it is 90 feet wide and 250 feet deep.

2. This line was established by two eminent English surveyors whose names it bears, to settle the disputed boundary between Pennsylvania, and Virginia and Maryland. This line afterward became famous as marking the boundary between slave and free labor. John Randolph first used the words in this connection.

3. Lake Chautauqua, which is located near Lake Erie, discharges its waters into the Allegheny river.

4. The Hudson river is so called, because its scenery resembles that of the Rhine.

5. That part of Pennsylvania which borders on Lake Erie is so called. Originally, the northern boundary ran straight west, and Pennsylvania did not touch the lake. This "triangle" was purchased by the state from the United States for \$150,000. The state also paid the Iroquois \$2,000 for their claims. Why did Pennsylvania purchase this tract?

6. Along the western shore of the lower part of the Hudson river, is an almost perpendicular wall of rocks from 200 to 300 feet high. This wall, which extends for about 20 miles, gives to the river a grand and imposing scenery.

7. The word is derived from the Indian *O-ni-au-ga-rah*, which means the "Thunder of Water."

8. In New Jersey, there are a number of salt water marshes, in which large cedar trees are found imbedded in the mud, a few feet below the surface. These trees have been buried here for many centuries, and are in a good state of preservation. Some are over six feet in diameter.

9. This obelisk was first erected in Heliopolis, in Egypt, about 3,000 years ago. In 1880, it was brought to New York and placed in Central Park. It is cut from one piece of granite, and is 70 feet high.

10. The rocks over which the waters fall are constantly wearing away, at the rate of about a foot in a year. A century ago the falls were over 100 feet nearer Lake Ontario. Eventually, they will reach Lake Erie, and the bed of this lake will become dry land.

11. During the carboniferous age, vegetation grew very rapidly—so rapidly that it accumulated, in half decayed form, to a great depth. In the catastrophies of nature (earthquakes, etc.), this thick layer of vegetable matter was buried under portions of the earth's crust, and after the lapse of ages, became transformed into coal.

12. Coal, petroleum and gas, are nearly the same in chemical composition. It is probable that petroleum, like coal, is of vegetable origin. Natural gas is formed in the same manner as petroleum, or directly from it.

LESSON V.

THE SOUTHERN STATES

NORTH CAROLINA, SOUTH CAROLINA, TENNESSEE, GEORGIA, FLORIDA, ALABAMA, MISSISSIPPI, LOUISIANA, OKLAHOMA, ARKANSAS, TEXAS.

[SKETCH and TOPICAL OUTLINE to be made by the pupil.]

SUPPLEMENTARY.

QUESTIONS.

1. What noted cave is found in Georgia?
2. Can you locate and describe the Dismal Swamp?
3. What and where are the great "Raccoon Banks?"
4. What remarkable plant grows in the Carolinas?
5. What is the largest state east of the Mississippi?
6. What is the meaning of the word Oklahoma?
7. Are there any Indians in Florida?
8. How was the soil of Louisiana probably formed?
9. From what point may seven states be seen?
10. What famous springs are found in Arkansas?
11. What is alabaster, and where is it found?
12. Locate and describe the "Enchanted Mountains."

ANSWERS.

1. This cave, known as Nicojack cave, is in the northwestern part of the state in an eminence of Raccoon mountain. A stream of cool water issues from it. The roof of the cave is a smooth limestone rock. Its end has never been reached.

2. This swamp, which covers 150,000 acres, is located in the northeastern part of North Carolina, a portion ex-

tending into Virginia. In some places the bushes and vines are so dense that a man cannot penetrate it.

3. Along the shores of Georgia there are banks formed of oyster shells. The young oysters attach themselves to the shells of the old ones, and as each dies, its shell is added to the bank, which finally becomes very large and at low tide is above the water. The raccoons feed upon the young oysters, hence the name.

4. Venus' Fly-trap, a plant which possesses the wonderful power of moving its leaves. The leaves are in pairs, united by a kind of hinge. If an insect alights upon the inner surface, the leaves close up like a trap, capturing the victim. The leaves remain closed until the insect has been absorbed, when they open again. Does the plant *eat* the insect?

5. Georgia.

6. The word means Indian's Land.

7. On an island in the everglades of this state is a tribe of Indians, the survivors of the Seminoles.

8. The mouth of the Mississippi was once much farther inland than it now is, and the soil was brought down by the river. It was formed like the present delta.

9. From the top of Lookout mountain seven states may be seen. What are they?

10. The *hot springs* are located in a mountain region in the western part of the state. The temperature of their waters ranges from 100° to 150° Fahr. Their healing properties are marvelous.

11. Alabaster is sulphate of lime. It looks like chalk. In the southwestern part of Arkansas there is a mountain of this material.

12. The Enchanted mountains are spurs of the Cumberland range in northeastern Tennessee. Human foot-prints are distinctly marked in the solid rock. The feet have *six* toes, and one of the tracks is sixteen inches long. There are also tracks of horses and other animals. In this vicinity is the Big Bone cave, in which are found the bones of the mastodon and other huge animals.

LESSON VI.

THE MIDDLE STATES.

OHIO, INDIANA, ILLINOIS, KENTUCKY, MICHIGAN, WISCONSIN, MINNESOTA, NORTH DAKOTA, SOUTH DAKOTA, IOWA, NEBRASKA, KANSAS, MISSOURI.

[SKETCH and TOPICAL OUTLINE to be made by the pupil.]

SUPPLEMENTARY.

QUESTIONS.

1. A part of Minnesota extends farther north than any other state. Where and why is this?
2. What and where are the "Pictured Rocks?"
3. What was known as the "Western Reserve?"
4. What are "sink holes," and where are they found?
5. What and where are the "Walled Lakes?"
6. What peculiar rock formation is found in Minnesota?
7. What natural curiosities are found in Indiana?
8. What was the "Ohio and Michigan War?"
9. What famous mines are found in Michigan?
10. What is the straightest river in the United States?

ANSWERS.

1. After the Revolutionary war the western boundary was run due north from Lake Itasca to a point northwest of Lake of the Woods, then east, and south to Rainy river. The northern boundary of the western part of the United States was later fixed at 49° north latitude, leaving this offset. See map in any geography.

2. Along the southeastern shore of Lake Superior is a line of precipices which has the appearance of a series of lofty battlements, and ruins in infinite variety. These "pictured rocks" extend for a distance of twelve miles, and present every variety of color.

3. When Connecticut ceded her western domains to the United States, she reserved a tract of 3,666,921 acres in northeastern Ohio. This became known as the *Western Reserve*.

4. In several parts of Kentucky, there are depressions in the surface, shaped like an inverted cone; they are from 100 to 200 feet in circumference, and fifty to seventy-five feet deep. One can hear the sound of running water beneath them. How were they probably formed?

5. In Iowa and the Dakotas are a number of shallow lakes surrounded by walls of stones. Since the lakes freeze solid (to the bottom) it is thought that the expanding of the ice while freezing gradually pushes the rocks to the shore. These lakes are among the most remarkable of natural curiosities.

6. The famous pipe-stone quarry, located near the town of Pipestone. The rock when taken from the quarry is soft and plastic, so that it might be moulded into any shape. When exposed to the air it hardens rapidly.

7. The Wyandotte cave, in which one chamber is 350 feet long and 250 feet high—containing wonderful formations of stalactites and stalagmites, and crystals of alabaster, is a wonderful freak of nature. Near Indianapolis is a subterranean lake of pure water, from which the city is supplied.

8. When the northern boundary of Ohio was fixed by congress, it was defined to be a line running due east from the southern extremity of Lake Michigan. But it was afterward found that Lake Michigan extended farther south than was supposed, and Michigan claimed a strip eight miles wide, including Toledo, as belonging to her. The matter occasioned much local excitement. Congress decided in favor of Ohio, and ceded to Michigan the northern peninsula in lieu of the disputed territory.

9. The copper mines along the shores of Lake Superior. These mines were worked by a prehistoric people who had stone implements. In many places the copper is found in almost a pure state.

10. The Red river of the North is the straightest of the *large* rivers in the United States.

LESSON VII.

WESTERN STATES AND TERRITORIES.

MONTANA, WYOMING, IDAHO, WASHINGTON, OREGON,
CALIFORNIA, NEVADA, COLORADO, UTAH, NEW
MEXICO, ARIZONA.

1. SKETCH and TOPICAL OUTLINE to be made by the pupil.

SUPPLEMENTARY.

QUESTIONS.

1. What and where is "Death Valley?"
2. Describe the "big trees" of California.
3. What is the largest county in the United States?
4. Can you tell how Salton Lake was formed?
5. What and where is the Golden Gate?
6. Describe the Grand Cañon of the Colorado.
7. What remarkable lake is found in Oregon?
8. For what is Butte City noted?
9. What is the "Garden City of Utah?"
10. What body of water contains no fish?
11. Where is Iron county? Why so named?
12. What ancient ruin is found in Arizona?
13. How is much of the desert land of this region rendered productive?

ANSWERS.

1. This is a volcanic region in southern California. It is forty miles long, and its bottom is 150 feet below the ocean level. The temperature rises to 135° Fahr. and from fissures in the rocks gases emanate, which, combined with the heat, are destructive to life.

2. These gigantic hemlocks are the largest trees in the world. They are found on the western side of the Sierra Nevada in the vicinity of Mariposa county. Many

of these trees are 375 feet high and over thirty feet in diameter.

3. Custar county in Montana. It is 150 miles long and 125 miles wide. It received its name from the fact that Custar and his men were massacred here.

4. A few years ago, there existed in southern California, a depression which was 300 feet below the ocean level. During the wet season of a certain year, the Colorado river in overflowing its banks sent a large stream of water into this depression, forming the lake. A branch of the river still flows into this lake

5. The entrance to San Francisco bay, on each side of which are high precipices, is called the Golden Gate.

6. The Colorado cañon is located in western Arizona. The rocks rise perpendicularly from the water to the height of 7,000 feet at some places. The water seems to have worn this channel, 1,000 feet of which is through solid granite.

7. In the southwestern part is a lake in the crater of a volcano. It is called Crater Lake, and is the deepest lake in the United States. It is 7,000 feet above the ocean level.

8. Butte City is said to be the largest mining town in the world.

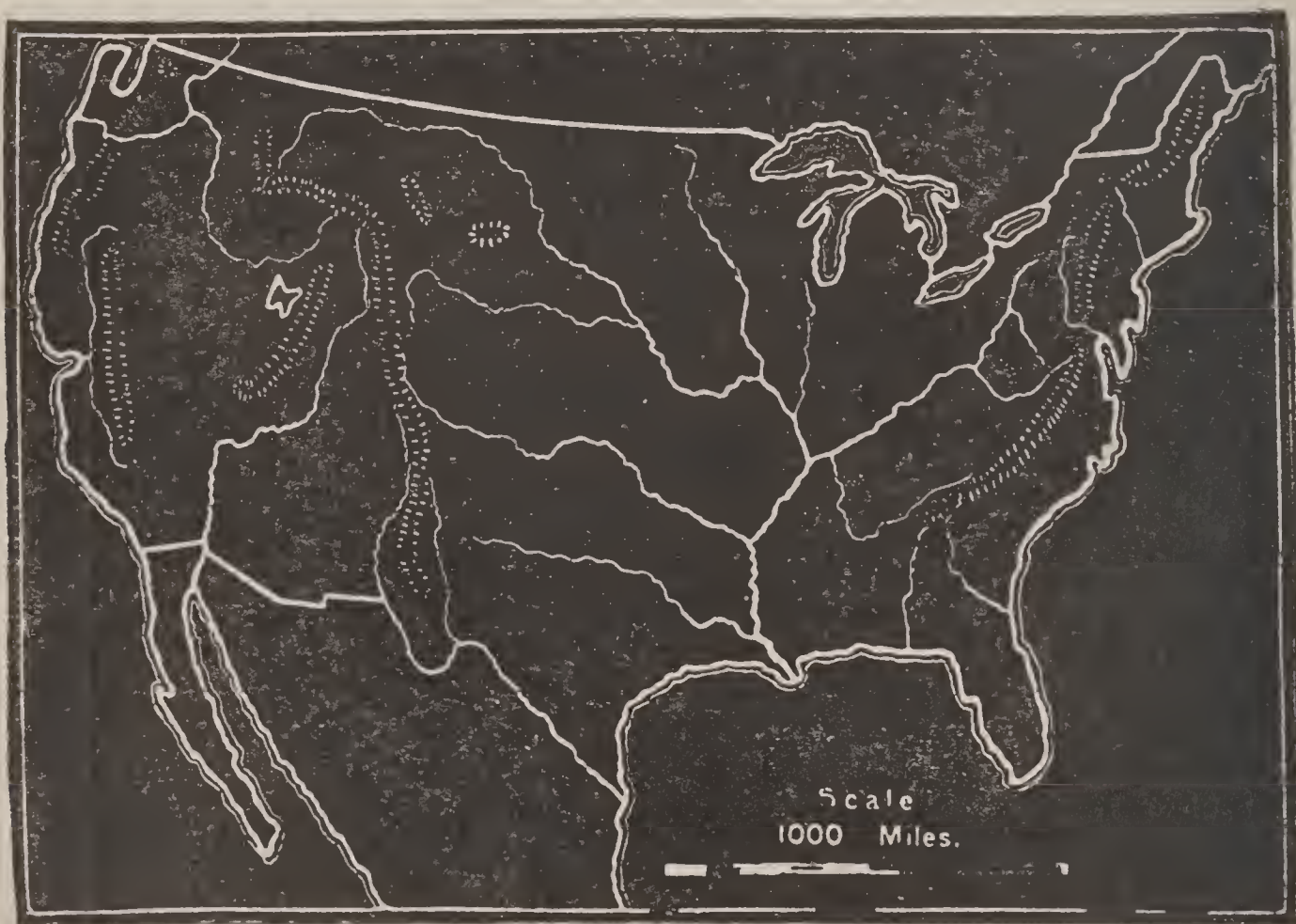
9. Prevo, on Lake Utah, is so called. It is an oasis in a desert.

10. There are no fish in Great Salt Lake.

11. Iron county is in Utah. There are a number of iron mountains in this county which are estimated to contain over 100,000,000 tons of iron ore.

12. The ruin of Casa Grande, which means the "big house," is situated a few miles south of the Gila river, in Arizona. This prehistoric ruin is 63 feet long and 45 feet wide, and the walls, still standing, are about 40 feet high.

13. This is done by irrigating the land from the mountain rivers and lakes. There are three systems of irrigation: One is to flood the land; another, to conduct the water in ditches and furrows; but the third and best method is to conduct the water by means of porous tiles laid underground through which the water is constantly running.

LESSON VIII.**THE UNITED STATES.****MAP DRILL.**

1. How far is it from New York to San Francisco? 2. Where must a north-and-south line be drawn to divide the United States into two equal parts? 3. Where is the most northern point? (Answer: In the region of the Lake of the Woods—here the boundary line passes north about 30 miles.) 4. Which extends farther south, Texas or Florida? 5. What two points are farthest distant from each other? 6. Draw two straight lines that indicate the great watersheds in the United States.

TOPICAL OUTLINE.

- 1. Position.**
 - { 1. Boundaries;
 - { 2. Latitude and Longitude.
- 2. Area.**
 - { 1. Absolute;
 - { 2. Relative. (Compared with other N. A. countries)
- 3. Surface.**
 - { 1. Atlantic Plains; 2. Mississippi Valley;
 - { 3. Great Plains; 4. Rocky Mountain Plateau;
 - { 5. Mountains;
 - 1. Systems; 2. Ranges;
 - 3. Valleys;⁸ 4. Peaks.
- 4. Coast Line.**
 - { 1. Indentations;
 - 1. Bays; 2. Gulfs; 3. Sounds.
 - { 2. Projections;
 - 1. Peninsulas; 2. Capes.
- 5. Rivers and Lakes.**
 - { 1. River Systems;
 - 1. Atlantic; 2. Pacific;
 - 3. Gulf; 4. St. Lawrence.
 - { 2. Great Lakes.
- 6. Climate.**
 - 1. Temperature; 2. Moisture; 3. Winds.
- 7. Productions.**
 - 1. Vegetables; 2. Minerals; 3. Manufactures.
- 8. Occupations.**
 - { 1. Agriculture; 2. Mining;
 - { 3. Manufacturing; 4. Commerce.
- 9. Important Cities.**
 - 1. Capitals; 2. Other Cities.
- 10. Government.**
 - 1. Form; 2. Departments; 3. Officers.
- 11. Inhabitants.**
 - { 1. Character; 2. Races;
 - { 3. Prehistoric Inhabitants.
- 12. History.**
 - { 1. Discovery; 2. Settlements;
 - { 3. Territorial Development.
- 13. Natural Curiosities.^{2, 7, 8}**

SUPPLEMENTARY.

QUESTIONS.

1. What cities have been capitals of the United States?
2. Describe the Yellowstone Park.
3. What is the origin of the words "Uncle Sam?"
4. What ruins are found in New Mexico?
5. When and how was gold discovered in California?
6. What and where was New Echota?
7. What famous salt springs in New York?
8. Describe Yosemite Valley.
9. Compare the largest and smallest of the United States.
10. Describe the St. Clair tunnel.
11. With whom did the words United States of America originate?
12. Can you explain this: "There is a time when the sun does not set in the United States?"
13. What remarkable artesian well in South Dakota?
14. Describe the Mammoth Cave of Kentucky.
15. A man once crossed the United States in a canoe, which he carried from one water-way to another. He carried the canoe only 12 miles; can you trace the route?
16. Why has Rhode Island two capitals?
17. Why is the climate along the coast of Alaska so mild?
18. What remarkable geological formation is found in northwestern New York?
19. What strange lake is found in the western part of Virginia?
20. What is remarkable about the timber which grows in Florida?
21. Which mountains are the older, the Appalachian or the Rocky mountains?
22. Why is the place where our capitol stands interesting in Indian tradition?

ANSWERS.

1. New York was the first capital of our country; in 1791, Philadelphia became the capital; and, in 1800, the seat of government was established at Washington.

2. The Yellowstone Park, the "Wonderland" of America, is situated in the northwestern part of Wyoming, including a small portion of Idaho and Montana. It is 65 miles long and 55 miles wide, and is "walled in" by high mountain ranges. Here are a large number of geysers which throw jets of hot water to a height of 200 feet. The falls of the Gibbon river, Yellowstone lake, and the Grand Canon are other instances of nature's marvels. It is, undoubtedly, the most remarkable region in the world.

3. In the war of 1812, Samuel Wilson, commonly called "Uncle Sam," was the government's beef and pork inspector. Elbert Anderson, a contractor, marked the barrels in his shipments with "E. A." for his name, and "U. S." for the United States. Wilson's workmen being puzzled by these last letters inquired their meaning. Some one suggested that they stood for "Uncle Sam." The jest seemed a good one, and the name passed into popular parlance.

4. In the southeastern part are the ruins of an ancient city whose history is shrouded in mystery. It is supposed by some to have been a Spanish settlement, but in 1685 it was already in ruins.

5. Gold was discovered on the 19th of January, 1848, by James W. Marshall, on Captain John A. Sutter's farm. This gold region of the Sacramento valley is the richest in the world. It is said that the discoverer of this immense wealth died in the poor-house.

6. The Cherokee Indians had, with the aid of missionaries, formed a republic of which New Echota was the capital. They had adopted the customs of civilized people; had set up a printing press and issued a newspaper; the alphabet which they used was invented by *one of the natives*.

7. These springs are found in Syracuse and vicinity. The brine is pumped from the springs into large vats where it is evaporated by the sun, or into tanks, and evaporated by

artificial heat. The vats cover several hundred acres. A cubic foot of brine yields 14 pounds of salt.

8. Yosemite Valley is a deep gorge in the Sierra Nevada, in the vicinity of the "big trees." It is about 10 miles long and one mile wide. A precipice called the "bluff," rises 3,089 feet perpendicularly above the valley; waterfalls leap over its sides at the height of 1,000 feet; and the bottom is covered with a forest of great oaks. It is the most wonderful valley in the world.

9. It would require 220 states the size of Rhode Island to make one as large as Texas.

10. This tunnel, which passes under the St. Clair river, is over five miles long, and connects Sarnia in Canada with Port Huron in the United States. It is in the form of a tube and is perfectly water tight. It is ventilated by air which is pumped into it, and heated by steam pipes.

11. It is said that Thomas Paine, in a letter to a friend, used these words in referring to a proposed union of the States.

12. The most eastern part of Maine is Eastport in longitude $66^{\circ} 56' W.$; and the most western of the Aleutian islands is in longitude $166^{\circ} 10' E.$ On the last days of June the sun rises in Eastport before it sets in the Aleutian Islands. During the rest of the year when the sun is farther south this does not occur.

13. At Woonsocket there is a well which discharges 250 barrels of water every minute. The well is over 700 feet deep and has a pressure of 150 pounds to the square inch. It is the strongest well in the world.

14. The Mammoth Cave is near the Green river in Kentucky. It is the largest cavern in the world. It is divided into many chambers, and contains many strange and grotesque forms. Haunted Chamber is a narrow passage two miles long. Streams, in which are found eyeless fish, and pits of unknown depth are found in many places. It has been explored for a distance of ten miles.

15. Elbert Rappleye, on April 10, 1890, started from New York, passed through the Hudson river, Erie canal and Lake Erie; then overland to Lake Chautauqua; then through outlet of Lake Chautauqua and Allegheny river,

Ohio river, Mississippi river, Missouri river; then across a portage, and through Hell Gate river, Missoula river, Clark Fork, and Columbia river.

16. Rhode Island was at one time divided into two "plantations"—Providence and Rhode Island. When they were united, each was reluctant to give up its capital. By a compromise it was agreed that both should be kept, and that the legislature should meet alternately at both places.

17. The warm Japan current, which touches the shores of Alaska, tempers the climate so that in some places it is as warm as Tennessee.

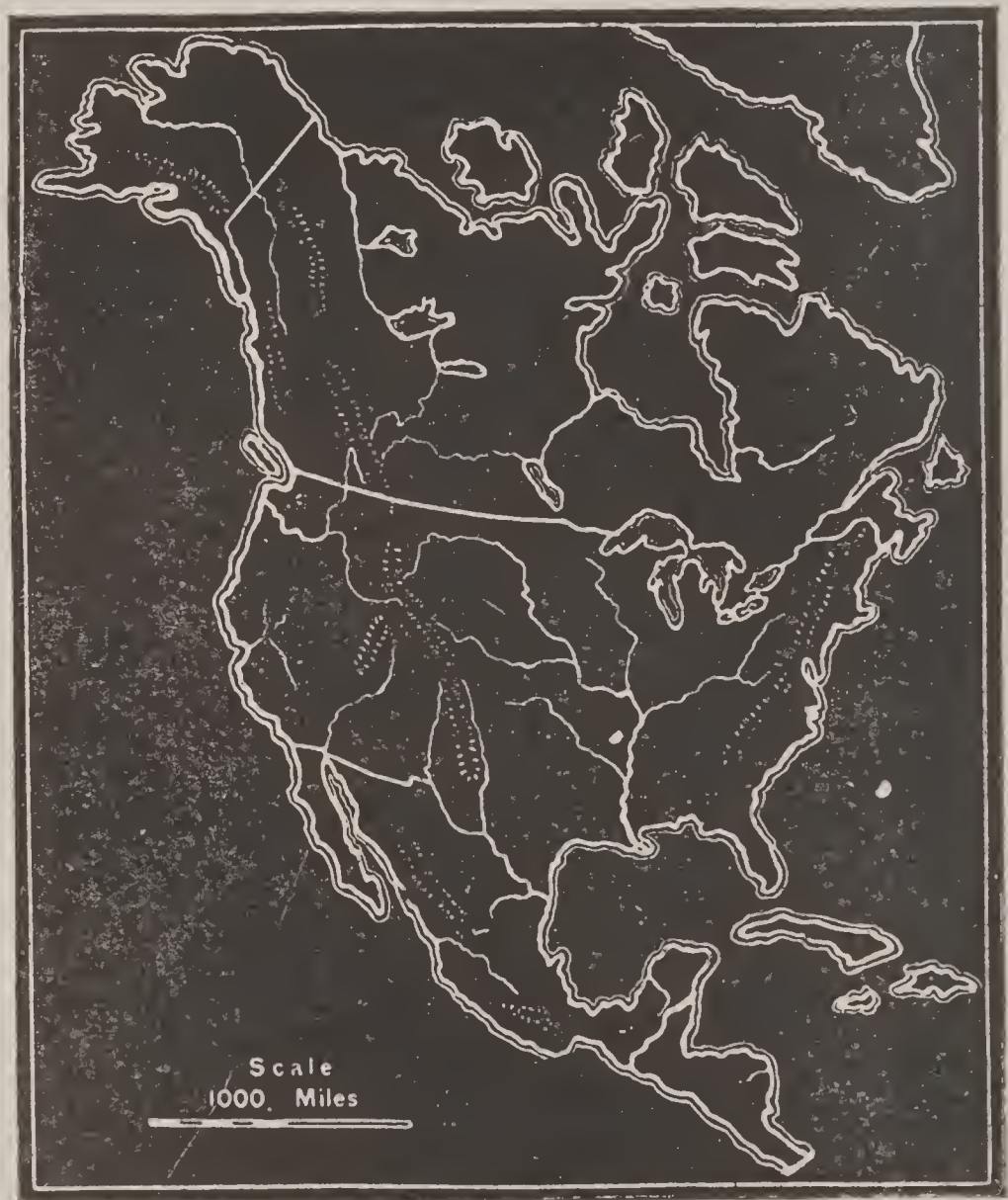
18. From the Niagara river to the Genesee river near Rochester there is a ridge, called the Alluvial Way, which is about 100 feet broad, and rises 30 feet above the surrounding country. It is composed of an entirely different formation. It was once, no doubt, much higher than now.

19. When this part was first explored there was a marsh on the top of a mountain nearly 4,000 feet high. A small river near this marsh having ceased to flow, some years after the waters in the marsh began to rise until it submerged the tallest trees. The lake is now 500 feet deep.

20. The heaviest wood in the world—black ironwood—grows in Florida only. It is 30 per cent. heavier than water. Nearly all the wood which grows here will sink in water, even when thoroughly dried.

21. The Appalachian mountains must have been thrown up long ages before the Rockies. They were once very much higher, and more rugged, than they are now. During the lapse of ages they have been worn down by the elements until their outlines are comparatively smooth.

22. Long before the advent of the white man, the Indian tribes assembled here to hold councils. This, then, may be considered to have been the capital of an ancient Indian empire. It is believed that Washington, to whom was given the honor of selecting a site for the *new capital*, was influenced by these Indian traditions in choosing this place. The Father of his Country was the friend of the Red Man, though he was often compelled to meet him in battle.

LESSON IX.**NORTH AMERICA.****MAP DRILL.**

1. Which is the largest country of North America? 2. How far is Cape Sabine from Cape Lisburne? 3. In what direction does the straight line boundary between Alaska and British America trend? Explain. 4. Would two persons starting at different points on the same parallel approach each other if they travel due north? 5. In what direction is Greenland from the north pole? 6. Does the sun ever shine perpendicularly upon any portion of the U. S.? 7. Where would you locate the central point of North America. 8. What separates North and South America? 9. Trace a water route from St. Louis to Chicago, on the sketch map, naming the different bodies of water traversed.

TOPICAL OUTLINE.

1. Position.

- { 1. Boundaries;
- { 2. Latitude and Longitude.

2. Area.

- { 1. Absolute;
- { 2. Relative. (Compared with other Grand Divisions.)

3. Surface.

- { 1. Cordilleras;
 - 1. Ranges; 2. Peaks;¹⁰ 3. Volcanoes.
- { 2. Appalachian Mountains;
 - 1. Ranges; 2. Peaks.
- { 3. Plains

4. Coast Line.

- { 1. Indentations;
 - 1. Bays; 2. Gulfs.
- { 2. Projections;
 - 1. Peninsulas;⁵ 2. Capes.

5. Islands.

- 1. West Indies; 2. Arctic Archipelago.

6. Rivers and Lakes.

- { 1. River Systems;
 - 1. Atlantic; 2. Pacific; 3. Arctic.
- { 2. Great Lakes;
- { 3. Lakes of British America.

7. Inhabitants.

- { 1. Native Races;
 - 1. Indians; 2. Esquimos.⁷
- { 2. Foreign Races;
 - 1. Caucasians; 2. Ethiopians; 3. Mongolians.
- { 3. Languages; 4. Occupations.

8. Political Divisions.

- { 1. Positions; 2. Governments; 3. Cities;
- { 4. Natural Resources;
 - 1. Vegetation; 2. Animals;³ 3. Minerals.

9. Climate.

- 1. Temperature; 2. Moisture.

10. History.

- { 1. Aboriginal Inhabitants.
- { 2. Prehistoric Inhabitants.

SUPPLEMENTARY.

QUESTIONS.

1. What is called the "Gibraltar of America?"
2. What and where is the North Magnetic Pole?
3. What is the supposed origin of the wild horses and cattle found on the western prairies?
4. Why cannot a man sink in Great Salt Lake?
5. What peninsula is sometimes an island?
6. Why are the Staked Plains so called?
7. What is the supposed origin of the Esquimos?
8. What is peculiar of the lakes of Mexico?
9. Can you give a proof that Iceland was once much warmer than it is now?
10. What and where are the "Twin Peaks"?
11. How many changes have been made in the spelling of the word "Bering"?
12. What and where is the "Boiling Pot"?
13. Who were the Montezumas?
14. Describe the proposed Nicaragua canal.

ANSWERS.

1. Quebec is so called because of its strong fortress.
2. The North Magnetic Pole, the place at which the magnetic needle becomes vertical, is near the western coast of Boothia peninsula.
3. It is thought that these immense herds have descended from the domestic animals that escaped from the early Spanish settlers.
4. About 20% of the water is salt in solution. This strong brine is much heavier than fresh water, and very easily floats the human body.
5. At times when the tides rise highest in the Pacific ocean, the isthmus which connects Lower California to the main land becomes submerged, making the peninsula an island.
6. In the early days the Santa Fe traders traveled over these plains, and as they were destitute of land marks, the travelers set stakes by which a definite route could be followed to the Gulf of Mexico, and other places.

7. It is supposed that the ancestors of the Esquimos, were Mongolians who crossed Bering strait at a very early date and settled on this continent. They resemble the Mongolians in many important particulars.

8. The lakes of Mexico seem to be drying up. Lake Tezcuco, formerly quite surrounded the city of Mexico, but at present the shore is several miles from the city. It has receded two miles within a hundred years.

9. Fossils in the slate rocks indicate that this island once had a tropical climate. Forests were once abundant, but at present there is not a tree on the island.

10. Popocatepetl and Iztaccihuatl are so called. On the top of the latter the rocks form the image of a woman. There is a superstition among the natives that this is the wife of Montezuma, the ruler of Mexico at the time of its conquest by the Spaniards. The name means, *the white lady*.

11. It was formerly written, Bhering; then it was changed to Behring; and finally it is Bering.

12. This name is applied to the falls a few miles below Quebec, where the water tumbles and pitches with such fury and in so many directions that it is difficult, in some places, to tell which way the stream flows.

13. When the Spaniards explored Mexico, they found a great empire in the interior whose capital was Tenochtitlan (where the city of Mexico now stands), in the midst of a lake. This was the stronghold of the ancient Montezumas, an enlightened line of Indian rulers. The city contained a population of 300,000, and was connected with the land by a number of causeways. Cortez conquered the city, and the brave Montezuma, who had treated him so generously at their first meeting, was slain.

14. The Nicaragua canal is to pass through Lake Nicaragua in Central America. The whole distance is $169\frac{1}{2}$ miles, only 27 miles of which needs to be excavated; the rest is free navigation in San Juan river, Lake Nicaragua, and a few smaller lakes. The lake is 110 feet above sea level. The canal will have a number of locks by means of which the vessels will be raised and lowered and the current retarded. The canal would shorten the water distance from New York to San Francisco by 10,000 miles.

LESSON X.**NORTH AMERICAN ISLANDS.**

[SKETCHES to be made by the pupil.]

TOPICAL OUTLINE.**1. West Indies.**

- { 1. Position;
- 2. Area and Surface;
- 3. Climate and Productions;
- 4. Inhabitants;
- 5. Divisions and Government;
 - { 1. Greater Antilles;
 - 2. Bahamas;
 - 3. Lesser Antilles.

2. Arctic Archipelago.

- { 1. Position; 2. Names;
- 3. Character of Surface.²

3. Greenland and Iceland.^{3*}

- { 1. Positions; 2. Names;
- 3. Volcanoes; 4. Geysers;
- 5. Ice Fields.²

4. Aleutian Islands.

- 1. Positions; 2. Surface; 3. Volcanoes.

SUPPLEMENTARY.**QUESTIONS.**

1. What is the name of the island on which it is thought Columbus landed?
2. Is the real form of the islands north of the American continent known?
3. When and by whom was Iceland discovered?
4. When was Greenland discovered?
5. What catastrophe fell upon the people of Greenland at the beginning of the fifteenth century?
6. Have the Esquimos become civilized?
7. Why is Iceland warmer than that part of Greenland which is in the same latitude?

*See Iceland in Map of Europe.

8. Where is Whale island?
9. What is the most northern town in the world?
10. For what is Pribilof island noted?

ANSWERS.

1. Watling's island, one of the Bahamas, is supposed to be the first land Columbus discovered in the western world.

2. Many of the islands in the Arctic archipelago are covered with ice to an enormous depth. These ice fields frequently extend out into the ocean making it difficult to determine where the land surface ends.

3. Iceland was discovered in the year 860, by a Norwegian pirate. A colony was founded here in 874, which soon became an independent republic, and even became the center of learning for a time when the continent of Europe was still in barbarism.

4. Greenland was discovered by a navigator from Iceland, about the year 981. It was from this place that the traditional voyages to Vinland or New England, were made.

5. About two hundred towns and villages, along the southern coast of Greenland, mysteriously disappeared.

When Captain Davis visited Greenland, in 1586, he found numerous ruins of buildings, but not a single white inhabitant.

Absolutely nothing is known concerning the fate of this colony.

6. The Esquimos have been visited by Moravian missionaries who have converted them to the Christian faith, and introduced schools among them.

7. The waters of the Gulf Stream pass near Iceland, and temper its climate to a considerable extent.

8. Whale island, so called from the large number of whales frequenting its vicinity, is situated in Baffin's bay.

9. Upernavik, in Greenland. Some contend that Hammerfest is farthest north. There is but little difference in their latitude.

10. This island, located west of the Alaskan peninsula, is the favorite haunt of the fur seal.

LESSON XI.

SOUTH AMERICA.



MAP DRILL.

1. What is the greatest length of South America? 2. What is the greatest width? 3. Where would you locate the center of this continent? 4. Compare the coast line of N. America with that of S. America. 5. Which has the better coast line? Why? 6. What is a bifurcation? 7. What famous one occurs in the northern part? 8. Trace a river-route from Trinidad on the Mamore to Bolivar on the Orinoco, on the sketch map. 9. Trace a water-route from Valparaiso to Asuncion. 10. Indicate two lines marking the water-sheds which trend east and west.

TOPICAL OUTLINE.

1. Position.

- { 1. Boundaries;
- { 2. Latitude and Longitude.

2. Area.

- { 1. Absolute;
- { 2. Relative.

3. Surface.

- { 1. Andes Mountains;
 - 1. Ranges; 2. Peaks; 3. Volcanoes.
- { 2. Plateaus of Brazil and Guyana;
- { 3. Low Plains;
 - 1. Pampas; 2. Llanos; 3. Selvas.

4. Coast Line.

- { 1. Indentations;
 - 1. Gulfs; 2. Bays; 3. Straits.
- { 2. Projections;
 - 1. Peninsulas; 2. Capes; 3. Isth. of Panama.

5. Islands.

- { 1. Galapagos; 2. Falkland;
- { 3. Terra del Fuego.

6. Rivers and Lakes.

- { 1. River Systems;
 - 1. Amazon;¹ 2. La Plata; 3. Orinoco.
- { 2. Lake Titicaca.

7. Inhabitants.

- { 1. Races;
 - 1. Native;¹³ 2. Foreign.
- { 2. Languages; 3. Occupations.

8. Political Divisions.

- { 1. Positions; 2. Governments; 3. Cities;
- { 4. Natural Resources;
 - 1. Vegetation; 2. Animals; 3. Minerals.

9. Climate.

- 1. Temperature; 2. Moisture.

10. History.¹⁶

- 1. Early Settlements; 2. Spanish Conquests.

SUPPLEMENTARY.

QUESTIONS.

1. Why is the Amazon river so called?
2. In what part of South America does it never rain?
3. Describe the Natural Bridge of Icononzo.
4. What and where is "Pitch Lake?"
5. What ancient ruins are found in Peru?
6. Where is a barrel used as a post office?
7. What is strange about the surface of Uruguay?
8. What and where are the "air volcanoes?"
9. Describe the people of Patagonia.
10. What is the "light-house of the Maracaybo?"
11. Where is the highest railroad tunnel in the world?
12. What and where is the "sea of grass?"
13. Who, originally, inhabited South America?
14. What is the most southern town in the world?
15. For what is Juan Fernandez noted.
16. Give a brief history of South America.

ANSWERS.

1. The tide rushes in at the mouth of the river with such sudden violence that the name Amassono, *boat destroyer*, was given to it by the natives.

2. In the Desert of Atacama in Bolivia, it never rains.

3. This is one of the most remarkable of curiosities. It is a stone arch 50 feet long and 40 feet wide, and stretches over a chasm 318 feet deep.

4. This lake is on the island of Trinidad; it is over $1\frac{1}{2}$ miles in circumference and of unknown depth. In the middle the pitch boils, but at the shore it is cold and hard.

5. There are two immense causeways, 1,500 miles in length, which extend from Quito to Cuzco. In many places they have been destroyed.

6. In the straits of Magellan there is a huge rock which overhangs the water; to this a barrel is fastened by a heavy chain. Letters are left in this barrel by ships passing through these waters, while others are taken out toward whose destination the ships may sail. Thus the passing and repassing ships take letters from this "post office" to all parts of the world.

7. The surface is a great plain upon which *not a stone of any kind* is to be found.

8. Near Carthagena on the northern coast is a number of small volcanoes, on the summits of which are craters filled with water. Bubbles of gas are constantly issuing from the openings, throwing water to a considerable height.

9. The Patagonians are a giant-like race of Indians. The average height of the men is $6\frac{1}{2}$ feet, and the women are almost as large as the men.

10. On the northeastern shore of the lake is a large deposit of pitch, which gives out a phosphorescent light during the hot months. The light is a sort of evanescent gleaming, and is of value to navigators as a "lighthouse."

11. This tunnel passes through a range of the Andes in Peru at an elevation of 3 miles.

12. The Llanos of the Orinoco have been so called. This region is a vast plain covered with a luxuriant growth of grass, furnishing feed for immense herds of cattle and horses, during the wet season.

13. It was inhabited by tribes of Indians who resembled the Indians of North America, and were, no doubt, of the same race; but they were less warlike in character, which was probably owing to the milder climate.

14. The most southern town in the world is Punta Arenas.

15. The island of Juan Fernandez, west of Chili, is celebrated for having been the solitary residence of Alexander Selkirk, whose adventures furnished the ground-work for that great and popular novel, Robinson Crusoe.

16. Columbus discovered the main land of America at the mouth of the Orinoco; and, it was this region of which Amerigo Vespucci wrote his description. The northwestern part of South America was inhabited by Indians who were considerably advanced in civilization, and whose wealth tempted the Spaniards. After many conflicts the infamous Pizarro conquered the Peruvian empire and established Spanish supremacy. A great man named Bolivar delivered the northwestern countries from Spanish dominion about the year 1810. Brazil, Uruguay, and Chili, have been making rapid progress in late years.

LESSON XII.

EUROPE.



MAP DRILL.

1. How do Iceland and Ireland compare in size? 2. What is the distance from Cape S. Vincent to the northeastern extremity of Russia? 3. Where must a line be drawn to measure the greatest north-and-south distance? 4. Which is the farthest north: Paris, France, or Montreal, Canada? 5. Which extends farthest south, England or Maine? 6. What is remarkable about the coast line of Europe? 7. Is this great irregularity to an advantage or disadvantage? Why? 8. Is any part of Europe in the frigid zone? 9. Trace a water-route from Vienna to London. 10. Trace a water-route from St. Petersburg to Rome. 11. Draw a line which shall mark the water-shed in Russia.

TOPICAL OUTLINE.

1. Position.

- { 1. Boundaries;
- { 2. Latitude and Longitude.

2. Area.

- { 1. Absolute;
- { 2. Relative.

3. Surface.

- { 1. Eastern Plains.
- { 2. Scandinavian Plateau;
- { 3. Mountains;
 - 1. Systems; 2. Ranges;
 - 3. Peaks;⁵ 4. Glaciers.

4. Coast Line.

- { 1. Indentations;
 - 1. Seas; 2. Gulfs; 3. Bays.
- { 2. Projections;
 - 1. Peninsulas; 2. Capes.
- { 3. Straits and Channels.

5. Islands.

- { 1. British Islands;
- { 2. Mediterranean;
- { 3. Zealand; 4. Nova Zembla.

6. Rivers and Lakes.

- { 1. River Systems;
 - 1. Atlantic; 2. Mediterranean; 3. Arctic.
- { 2. Northern Lakes;
- { 3. Alpine Lakes.¹³

7. Inhabitants.

- { 1. Races;
 - 1. Aboriginal; 2. Modern.
- { 2. Languages; 3. Occupations; 4. Productions.

8. Political Divisions.

- { 1. Positions; 2. Governments; 3. Cities;
- { 4. Natural Resources;
 - 1. Vegetation; 2. Animals; 3. Minerals.

9. Climate.

- 1. Temperature;²⁴ 2. Moisture.

10. History.³⁰

SUPPLEMENTARY.

QUESTIONS.

1. Where is the "land of the midnight sun?"
2. What is the most populous country in the world?
3. What rapid mail transit between Paris and Berlin?
4. How are the lowlands of Holland drained?
5. What phenomenon is seen on Kilhorn peak?
6. Are there any reptiles in Ireland?
7. What spectral delusion appears in the Hartz mountains?
8. What were the ancient names of France, Spain, Switzerland, and Ireland?
9. What and where are Fingall's cave and Giant's causeway?
10. What and where is the "light-house" of the Mediterranean?
11. What invention was made at Metz, in Germany?
12. Describe the St. Gothard's tunnel.
13. What phenomenon appears in Lake Constance?
14. What and where are the "eternal fires?"
15. How is Amsterdam built?
16. Relate some instances of the wealth and extravagance of the Czar of Russia?
17. What great buildings are found in Rome?
18. In what part of Europe is petroleum found?
19. How is Venice built?
20. What and where is Antonine's Wall?
21. What famous ruins are found near Naples?
22. Describe the republic of San Marino.
23. What are the "five great powers" of Europe?
24. The latitudes of Chicago and Rome are the same; what causes the difference in climate?
25. What is meant by the "*Marriage of the Adriatic?*"
26. What is the largest enclosed body of water?
27. What and where is the Maelstrom?
28. What and where is Maeshowe?
29. Into what three classes are the people of Europe generally divided?
30. Give a brief history of Europe.

ANSWERS.

1. The Scandinavian peninsula has been so called because the sun does not set during a few days at midsummer. At that time the sun can be seen at *midnight*.

2. Belgium is the most densely settled country in the world, containing over 125 inhabitants to the square mile.

3. A pneumatic tube connects Paris and Berlin. It is used for postal purposes, and makes it possible for a letter mailed at Paris to be delivered in Berlin in 35 minutes.

4. A large portion of Holland is from 10 to 15 feet below the sea level, and is drained by large wind-mill pumps. This land was once covered by the ocean. Immense dykes are built along the coast to keep out the water.

5. In the northern part of Norway is a mountain, called Kilhorn peak, through which a large opening passes north-and-south. At midsummer the sun shines through this perforation from the south, at noon, and from the north at midnight.

6. There are but very few reptiles in Ireland. It is believed by the people that they were destroyed and forever banished from the island by St. Patrick. The superstition that a snake cannot live on Irish soil is not true.

7. One of the peaks has the form of a man; and, under certain circumstances, the gigantic image is reflected upon the clouds. It is called the "*Specter of the Brocken*."

8. France was called Gaul; Spain, Hispania; Switzerland, Helvetia; and Ireland, Hibernia.

9. Fingall's cave is on the island of Staffa. It is a basaltic cavern, 225 feet long, 165 feet high, and 66 feet wide at the entrance. Giant's causeway, 600 feet long, is on the northwestern coast of Ireland. It is another group of basaltic columns, standing closely together. These columns are as regular as works of art, and have from three to seven faces. There is a tradition among the people that it was built by a race of giants.

10. The volcano, Stromboli, which is 2,500 feet high, and whose constant fires light up a large portion of the Mediterranean sea, is so called.

11. The art of printing was invented by John Guttenberg at this little city.

12. This tunnel passes through the Alps mountains and is 10 miles long. It is the most remarkable tunnel in the world.

13. Lake Constance lies in the Alps of Switzerland. Its waters are of a dark green hue, and subject to sudden risings from an unknown cause. In 1770, it rose 24 feet above its ordinary level in one hour.

14. On the shore of the Caspian sea near Baker, in Russia, gas is constantly escaping from crevices in the earth. This, having been set on fire, is continually burning.

15. The greater portion of the city is built upon piles driven into the sands under the water; thus, the ocean rolls its waves under the city.

16. It is said that a single carriage belonging to the Czar cost more than the White House at Washington; that he keeps nearly 1,000 horses, which cost the government nearly \$1,000,000 a year; and that the crown he wears is the costliest in the world.

17. St. Peter's church, 613 feet long, 286 feet wide, and 435 feet high, is the largest and finest in the world. Its building required 176 years, and cost \$50,000,000. The vatican, in which the popes reside, adjoins St. Peter's and contains 4,422 apartments.

18. Petroleum is found in large quantities in the region of the Caspian sea. It is somewhat inferior in quality to that found in the United States.

19. Venice is built on a group of small islands. It contains many magnificent buildings which seem to rise out of the water. The streets are water-ways, and boats take the place of vehicles. The land is nearly all covered with buildings.

20. Antonine's Wall is in Scotland, extending from the Forth to the Clyde, a distance of 27 miles. It was built by the Romans in 140 A. D. to keep back the native tribes.

21. The Ruins of Herculaneum and Pompeii, two cities which were buried by an eruption of the volcano of Vesuvius, 1,800 years ago.

22. This is the smallest republic in the world. It was founded by a hermit who came to make his abode here

some time during the fifth century. It has continued an independent republic to the present day.

23. Great Britain, Germany, France, Russia and Austria.

24. The Gulf Stream carries its warm waters to the western coast of Europe where they are gradually dispersed, and, as the winds from these warm waters are constantly passing over the continent, they temper the climate of all Europe.

25. Pope Alexander III, made a formal grant of the Adriatic to Venice, and the Doge, or Duke, chief ruler of Venice, was accustomed to go, annually, in a vessel, and throw a ring into the sea with great pomp and ceremony. This was called the *marriage of the Adriatic*.

26. Caspian sea is the largest body of inland water in the world. It is 740 miles long and 200 miles wide.

27. The maelstrom is a great whirlpool off the coast of Norway, in the vicinity of the Loffoden islands. It is caused by the meeting of two swift currents near one of the islands. At certain times it is so strong that it is dangerous to small vessels.

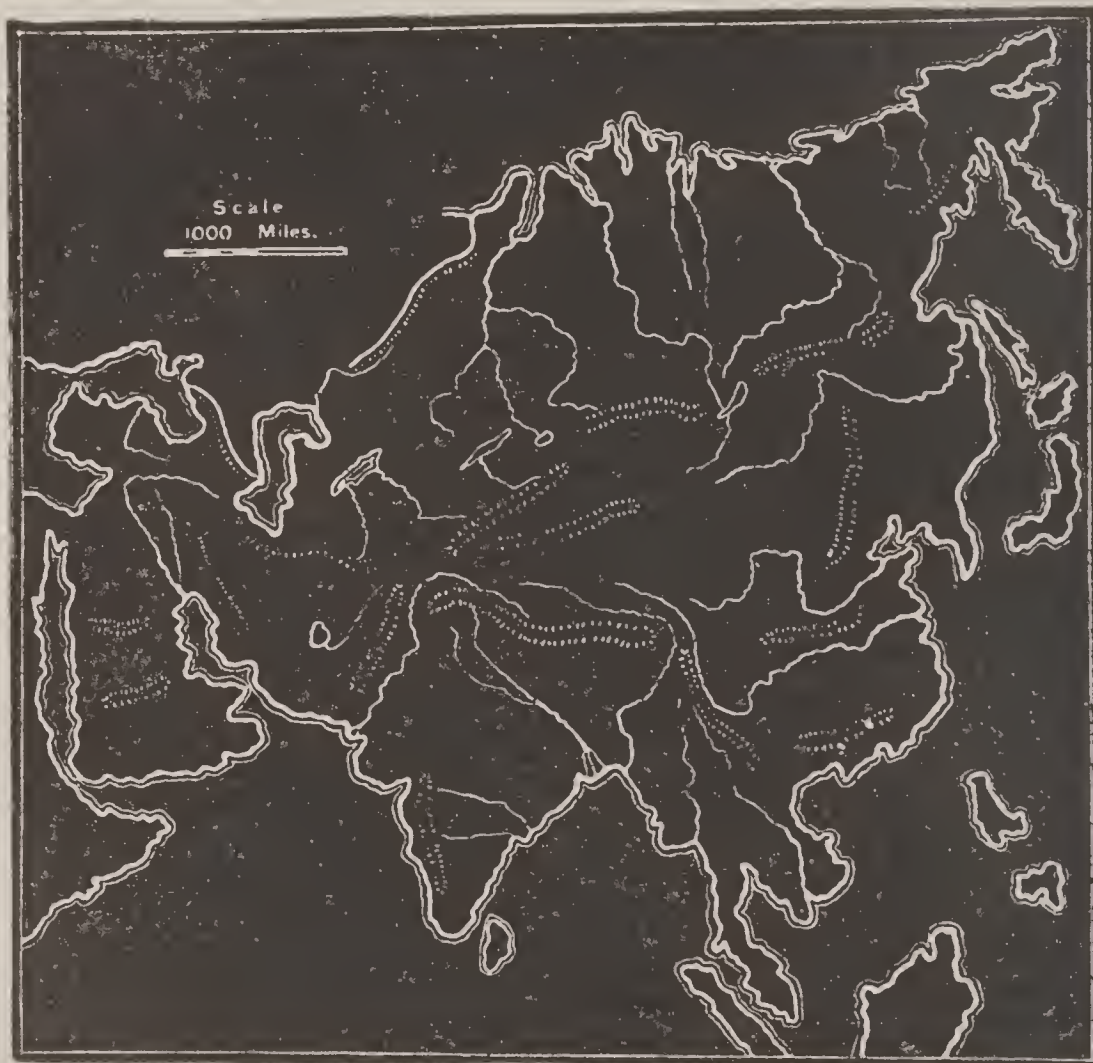
28. Maeshowe is a large artificial mound on one of the Orkney islands. It has a large interior chamber of unknown antiquity, and the object for which this huge structure was built in that unfrequented northern country is a matter of speculation. Some think it was used as a prison.

29. The *nobility*, who are the ruling class; the *gentry*, who include the wealthy classes; and the *peasantry*, who comprise the laboring classes.

30. A little over 2,000 years ago the only civilized portion of Europe was the empire of Rome. All the northern and western regions were inhabited by hordes of barbarians—races of wild people living in the woods. The people who lived in what is now France were conquered by Caesar, and Roman civilization was introduced. From thence it spread over Europe. But, from the year 500 to 1500 A. D., Europe passed through a gloomy period known as the "dark ages," when nearly every vestige of learning disappeared. At the close of this period a revival occurred which seemed to stir the whole continent. Since that time she has made wonderful progress. Russia, the last to awaken, has made an advancement scarcely paralleled in history.

LESSON XIII.

ASIA.



MAP DRILL.

1. How does the general outline of the map of Asia compare with that of Europe?
2. Where must a line be drawn to measure the greatest distance in Asia?
3. How long is this line?
4. What can you say of the direction of this line when compared with a similar one in Europe?
5. How far is Singapore from Cape Chelyuskin?
6. Where would you locate the center of Asia?
7. Draw a line which shall mark the water-shed.
8. Trace a water-route from Canton to Bushire, Persia.
9. Which extends farthest south, Kamchatka or Ireland?
10. Name the mountains marked in the sketch.

TOPICAL OUTLINE.

1. Position and Size.

- { 1. Boundaries;
- { 2. Latitude and Longitude.
- { 3. Relative and Absolute Area.

2. Surface.

- { 1. Mountain Systems;
 - 1. Himalaya; 2. Kuen Lun; 3. Altai;
 - 4. Thian Shan; 5. Hindoo Koosh.
- { 2. Plateaus;
 - 1. Thibet; 2. Iran; 3. Pamir.
- { 3. Deserts; 4. Plains; 5. Tundras.

3. Coast Line.

- { 1. Indentations.
 - 1. Seas; 2. Gulfs; 3. Bays.
- { 2. Projections.
 - 1. Peninsulas; 2. Capes.
- { 3. Straits.

4. Islands.

- { 1. Malay Archipelago;
- { 2. Japan Islands; 3. Ceylon.

5. Rivers and Lakes.

- { 1. River Systems;
 - 1. Pacific; 2. Arctic; 3. Indian.
- { 2. Fresh-Water Lakes;
- { 3. Inland Seas.

6. Inhabitants.

- { 1. Races; 2. Languages; 3. Religions;
- { 4. Occupations and Productions;
- { 5. Nomadic Tribes.

7. Political Divisions.

- { 1. Positions; 2. Governments; 3. Cities;
- { 4. Natural Resources;
 - 1. Vegetation; 2. Animals; 3. Minerals.

8. Climate.

- 1. Temperature; 2. Moisture.

9. History.

SUPPLEMENTARY.

QUESTIONS.

1. What is the oldest city in the world?
2. Describe the Great Wall in China.
3. Where is it thought the Garden of Eden was situated?
4. What and where is the lamp rock?
5. To what tortures are female children subjected in China, for fashion's sake?
6. What is said to be the coldest place in the world?
7. Describe the ancient "hanging gardens" of Babylon.
8. How do Chinamen salute each other?
9. In what country is the king called Lord of the White Elephants?
10. What large flower grows in Sumatra?
11. Who was Confucius?
12. How does the Chinese ruler show his homage to agriculture?
13. What is the highest lake in the world?
14. Why is the fabric, calico, so called?
15. What is a typhoon?
16. In what countries are many customs and beliefs the exact reverse of ours?
17. What is the highest inhabited spot in the world?
18. What is the oldest existing dominion on the globe?
19. What is the Sea of Isles.
20. What country is called the Roof of the World?
21. What is called the Cradle of Mankind?
22. In the East Indies there is a tree which sometimes covers several acres. Can you describe it?
23. What name is sometimes given to Europe and Asia?
24. What country is known as the "Sun-rise kingdom?"
25. What chain of mountains separates two races?
26. What people are natives of both hemispheres?
27. In what parts of the world are the pygmy races found?
28. What remarkable volcano is found in Japan?
29. Give a brief history of Asia.

ANSWERS.

1. Damascus, situated northeast of Jerusalem.
2. This wall, which extends from the Yellow sea to the region of Koko Nor, a distance of 1,250 miles, was built by the Chinese to keep back the Tartars. It was constructed 2,500 years ago, and employed several millions of men over five years.
3. There are many who believe that the Garden of Eden was situated between the rivers Tigris and Euphrates. This region, once remarkably fertile, is now a barren waste.
4. This famous rock is found on the shore of Lake Rangkul, in Central Asia. A light shines from out a cavity in the rock at an altitude of 200 feet. The natives have a superstition that the light comes from an immense diamond set in the forehead of a demon who is guarding vast treasures in the cave.
5. In China, a small foot is considered a mark of great beauty. A female child's feet are compressed so that they cannot grow. The shoes worn by adult women are but $3\frac{1}{2}$ inches long. They cannot walk without difficulty.
6. Werkhojansk, in Siberia, is thought to be the coldest place in the world.
7. These were merely terraces formed on large mounds. They were planted with every variety of vegetation, and were erected by Nebuchadnezzar to flatter the fancy of his queen, who came from the mountainous country of Media. The "gardens" were mountains in miniature.
8. In saluting, Chinamen shake their own hands instead of those of the persons greeted. They take off their shoes instead of their hats.
9. In Siam the white elephant is an object of worship, and the king is frequently addressed by his title.
10. The *Rafflesia Arnoldi*, which measures three feet across, and is the largest flower in the world.
11. Confucius was the founder of the religion still practiced by the court in China. It is simply a system of worldly morality. He was also a great teacher and law giver.

12. On the first day of the year, the ruler accompanied by the princes and minister, goes to a place called the Sacred Field, and with his own hands plows a furrow.

13. Lake Sirikol, the source of the Amoo river.

14. Calico took its name from Calicut, on the southwestern coast of India, where this fabric was first made.

15. The typhoon is a whirlwind which has a tendency to lift objects from the ground, and sometimes hurls them to a great distance. The region of Canton is often desolated by these violent hurricanes.

16. In China and Japan. In reading, they begin at the right of the page; the place of honor is the left hand; black is the color of gayety, and white the color of mourning; their religion teaches that the just will cease to exist after death, but the wicked will live forever.

17. On an elevation in Thibet, 16,430 feet above the level of the sea, there is a convent inhabited by a number of monks. This is the highest inhabited place on the globe.

18. China.

19. The Aral sea, the second largest inland body of water in Asia.

20. Thibet, which occupies the highest plateau in the world. It has a mean elevation of about fifteen thousand feet. It is also called the "Snowy Region of the North."

21. This name has been applied to the plain watered by the Tigris and Euphrates rivers.

It seems quite certain that civilization, in its primitive form, made its appearance in this region of the globe. Yet we are not able to know what empires may have been in existence in prehistoric ages.

22. The Banyan tree is a native of these islands. Its branches sends out shoots to the ground. which take root, and in turn become trunks which send out other branches. Thus the tree spreads over many acres.

23. Eurasia, a combination of the words, Europe and Asia.

24. Japan is so called, because it was the most eastern country known to the ancients.

25. The Himalaya mountains separate the yellow people of the north from the white on the south. It is also

peculiar that the vegetation on one side of this range differs very remarkably from that on the other side.

26. The Esquimos. They inhabited the northern regions of both Eurasia and America, when the latter was discovered by the people of Europe.

27. One of the pygmy races originally inhabited the Philippine islands and is still found in the most rugged parts. The Malay race has conquered them and driven them from the fertile plains.

The Bushmen of Africa and the Ainu, living on the islands north of Japan, may also be considered as belonging to the pygmy race.

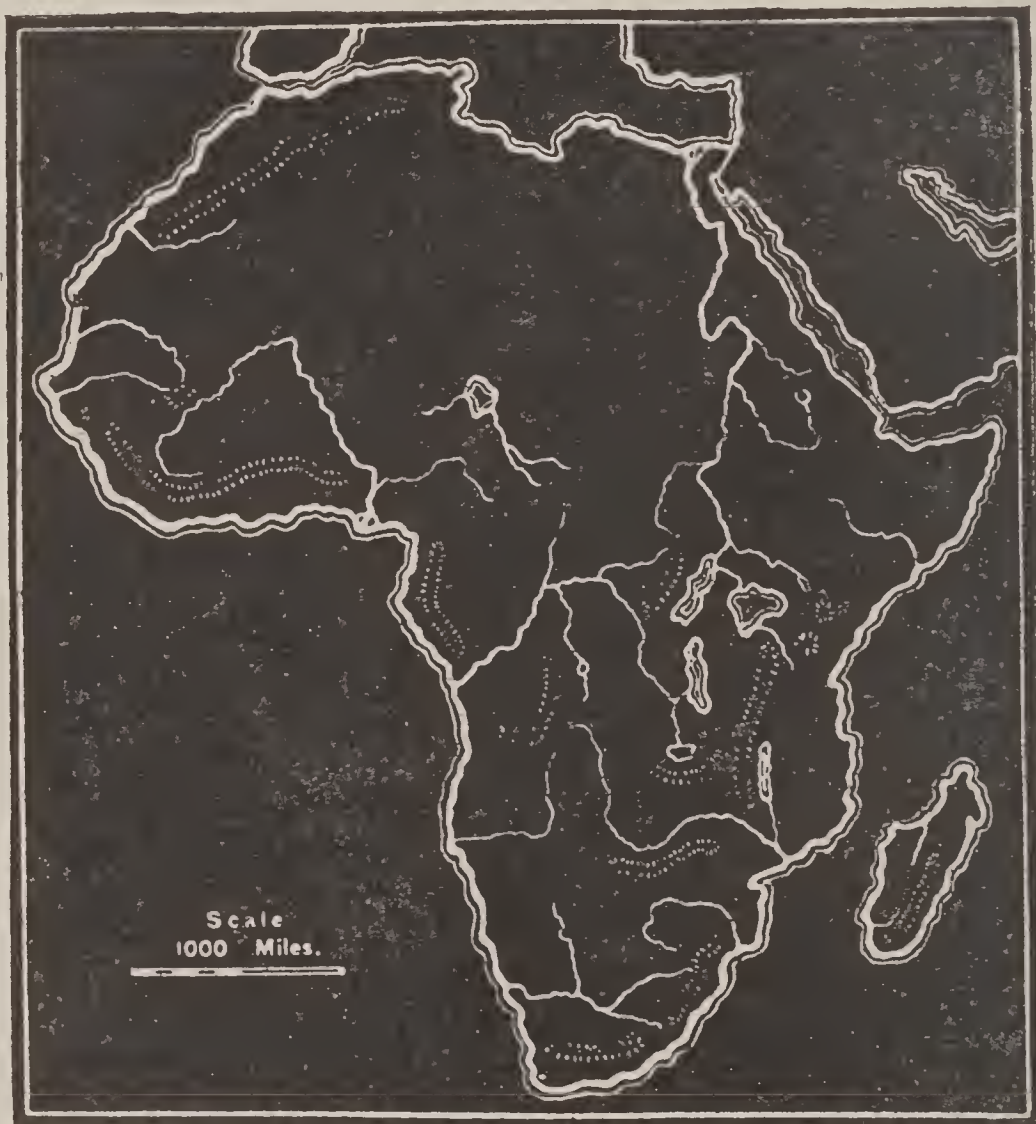
There is a tradition that there is a very diminutive people living in the mountains in the southern part of Central America. These reports seem so well authenticated that a number of scientists have begun a series of explorations to determine the real character of these people.

28. The volcano Aso San, near Kumamoto, Japan, has the largest crater in the world. It is 10 miles in diameter and is inhabited by 25,000 people. The encircling wall is nearly 1,000 feet high. There is an inner crater, about 1 mile in diameter, from which immense columns of steam gush forth. Earthquakes are of frequent occurrence.

29. Asia is supposed to be the original home of the human race. The first civilized people probably lived in the valley of the Euphrates, and from thence have gradually spread over the world. In this valley, in the year 2221, B. C., the great empire of Assyria was founded; in 536, B. C., Persia became the ruling power, and, 200 years later, Alexander conquered all the nations and made them subject to Macedon. About the year 600, A. D., the Saracens became masters of these regions, and 600 years later southern Asia was conquered by the Turks, who still hold dominion over it. China and the northern parts have changed but little for ages. There are traditions which indicate that China is a very ancient dominion, and that civilization first made its appearance here. Many modern inventions are claimed to have been known to them for ages before they were thought of by the white race.

LESSON XIV.

AFRICA.



MAP DRILL.

1. What grand division does Africa resemble in outline? 2. What is the greatest length of Africa? 3. What is the greatest width? 4. Where would you locate the center? 5. Which extends farther south, Africa or South America? 6. Name the mountains and rivers marked in the sketch. 7. What two points are farthest removed from each other? 8. Trace a water-route from Timbuctoo to Cairo. 9. Name and locate the capes and gulfs on the coast of Africa. 10. Name the mountains marked in the sketch. 11. Locate the equator and the tropics in the sketch.

TOPICAL OUTLINE.

1. Position and Size.

- { 1. Boundaries;
- 2. Latitude and Longitude;
- 3. Area.

2. Surface.

- { 1. Deserts;
 - 1. Sahara;^{3,7} 2. Kalahara; 3. Nubian.
- 2. Mountains;
 - 1. Atlas; 2. Nieuweveld;
 - 3. Kong; 4. Mossamba.
- 3. Coast Plains.¹²

3. Coast Line.

- { 1. Indentations;
 - 1. Seas; 2. Gulfs; 3. Bays.
- 2. Projections;
 - 1. Capes; 2. Isthmus of Suez.
- 3. Straits and Channels.

4. Islands.

- { 1. Madagascar; 2. Canaries;
- 3. Cape Verde Islands.

5. Rivers and Lakes.

- { 1. River Systems;
 - 1. Nile;⁹ 2. Congo; 3. Niger;⁹ 4. Zambezi.
- 2. Lakes having Outlets;
- 3. Lakes having no Outlets.

6. Inhabitants.

- { 1. Races;
 - 1. Native;² 2. Foreign.
- 2. Languages; 3. Religions; 4. Occupations;
- 5. Nomadic Tribes.

7. Political Divisions.

- { 1. Positions; 2. Chief Cities;
- 3. Natural Resources.

8. Climate.

- 1. Temperature; 2. Moisture; 3. Winds.

9. History.

SUPPLEMENTARY.

QUESTIONS.

1. What is said to be the hottest city in the world?
2. From what portion of Africa were the slaves in the United States brought?
3. What plan has been proposed for making the Sahara productive?
4. When were the pyramids of Egypt built?
5. What and where is Liberia?
6. What famous stone was found in the Nile?
7. What seems to prove that the Sahara was not always a desert?
8. Where is St. Helena, and for what is it noted?
9. What rivers diminish as they approach the sea?
10. What two men have explored the interior of Africa?
11. How has much of the Sahara been made productive?
12. What portion of Africa is over 500 feet below the sea level?
13. What and where is the Gate of Tears?
14. What was the Cape of Good Hope originally called?
15. There is a river in Africa which flows from its "mouth" toward its "source." Can you locate and describe it?
16. What town in Africa was named after a president of the United States?
17. What famous canal has no locks?
18. In what direction does the water in the Strait of Gibraltar flow?
19. Where do the dark "white people" live?
20. What is remarkable about the coast line of Africa?
21. What is remarkable about the rivers of Africa?
22. The ruins of what city are found near Tunis?
23. Can you describe the simoon of the desert?
24. What lake in Africa is sometimes larger than Lake Superior?
25. What remarkable geological formation exists in the Sahara?
26. Where is Vocal Memnon,—the *singing statute*?
27. Give a brief history of Africa.

ANSWERS.

1. Mecca, in Arabia, is believed to be the hottest city in the world. A slanting rock surface near by reflects heat upon the city, adding considerable to the equatorial temperature.

2. From the region of Lake Tchad. Millions of human beings have been captured, or purchased, in this region and sent as slaves to all parts of the world. Even, at present, it is estimated that 10,000 persons are annually sent from the Soudan to the Mediterranean states. The Arabs mostly carry on this shameful traffic.

3. The Sahara in the northern and western parts is, in many places, considerably below the level of the sea. It is thought that tunnels might be made into the ocean to flood these regions. These inland seas would increase the rainfall and make much of the desert productive.

4. The Great Pyramid is believed to have been erected about 5,000 years ago. This structure is 480 feet high, covering thirteen acres of ground, and required the labor of 100,000 men for thirty years for its construction.

5. In 1820, the American Colonization Society purchased lands in the western part of Guinea, and founded an independent republic as a refuge for slaves in the United States who had obtained their freedom.

6. A stone found in the Rosetta, one of the mouths of the Nile, contains an inscription in three languages; the hieroglyphic, demotic, and Greek. With the latter language as a key the meaning of the hieroglyphic characters has been discovered, making it possible to read the history of the past ages as it is inscribed on the stones in the pyramids. This stone is in the British Museum.

7. A large part of the Sahara is deeply furrowed by dry river beds.

8. St. Helena, a rocky island in the Atlantic Ocean, was the prison of Napoleon after his defeat by Wellington.

9. The Nile and the Niger. Much of the water is evaporated, and also, a large amount of it sinks into the sand. They have no tributaries along their lower courses.

10. Livingstone and Stanley. Prior to their explora-

tions, which were completed but a few years since, nothing was known about the interior of this "Dark Continent."

11. In the southern part of Algeria a large number of artesian wells have been dug. Vast orchards of fig trees are flourishing where all was barren a few years ago.

12. Much of Abyssinia is over 500 feet below sea level.

13. The Strait of Babel-Mandeb has been so called on account of its dangers to navigation.

14. It was called the Cape of Storms, by Diaz, its discoverer, but the King of Portugal, being so greatly pleased that a passage to India was found, changed its name to that of Good Hope.

15. This river extends from Lake Assal to the ocean near the Gulf of Aden. It flows from the ocean into the lake which is about seven hundred feet below sea level. The lake is drained by evaporation and is gradually being filled up with salt deposits.

16. Monrovia, the capital of Liberia.

17. The Suez canal has no locks. The country through which it flows is almost perfectly level.

18. A strong current continually flows into the Mediterranean. The few rivers which empty into this sea are not sufficient to supply the water evaporated.

19. The Moors of Africa and the Hindoos of Asia, belong to the white race, and in physical features resemble the people of Europe; but, having lived in equatorial climates for ages, their skin has become a deep brown.

It may be remarked on this point that the lines of distinction between the races are not clear, and it is very difficult to determine to what races certain peoples belong.

20. It has no deep indentations.

21. All the great rivers of this continent are made unnavigable by falls or rapids, so that not a stream is open very far to large vessels.

22. The ruins of the ancient city of Carthage, which was once the rival of Rome. It was the capital of the ancient Phœnician republic.

23. Simoon is the name given to severe windstorms which occur on the desert. Hot winds rise, unaccompanied by rain or clouds. The sky becomes darkened by great quantities of sand, which are heaped in immense drifts along the desert.

24. Lake Tchad, in Africa. During the wet season it is larger than Lake Superior, while during the dry season it is only about one-fourth as large.

25. In the desert of Sahara, where artesian wells have been sunk, underground rivers have been discovered. These rivers seem to be of considerable size, and abound in crabs, mollusks, and fishes. It is believed that the channels of these rivers were once on the surface and that the shifting sands buried them, in some cases several hundred feet below the surface. Gradually the water has crept along under the sand and re-opened the channels.

26. Vocal Memnon is a large monolith, nearly 50 feet high, standing on the banks of the Nile, near Thebes. Every morning at sunrise the statue gives forth musical sounds like those produced by harp strings. Scientists conjecture that this is caused by the unequal expansion, i. e., the part above ground expanding under the influence of the morning sun, while that part which is buried beneath the sands is not thus affected.

27. The northeastern portion of Africa was, in the earlier ages, the seat of learning and civilization. But only a very small portion of this continent was known to the ancients. The equatorial and southern regions were all unknown to them. After a time the great empire of Egypt crumbled into ruins, and another, on the northern coast, whose center was the great city of Carthage, sprang into existence. Carthage was finally conquered by Rome, and Africa ceased to be of interest to the world. In the seventh century the continent was again stirred by bands of warriors fighting for the cause of a new religion, Mohammedanism. At present the Turks and Moors rule the northern parts; the wild negro dwells in the interior; and colonists from England, France and Germany have settled in the southern regions.

LESSON XV.

AUSTRALIA.



MAP DRILL.

1. What is the distance from Cape Leuwin to Cape York?
2. What are the greatest east-and-west, and north-and-south distances on this continent?
3. In what direction would you look for the sun at noon in Australia?
4. How far is Borneo from Australia?
5. Name the principal capes and bays on the coast of the continent.
6. Which extends farthest south, Australia or Africa?
7. Name the mountains marked on the sketch.
8. Mark the location of the six largest cities.
9. What Grand Division does Australia most resemble in surface and climate?

TOPICAL OUTLINE.

1. Position and Size.

- { 1. Boundaries;
- 2. Latitude and Longitude;
- 3. Area.

2. Surface.

- { 1. Mountains;
 - 1. Coast Ranges; 2. Interior Ranges.
- 2. Interior Plateau;⁴
- 3. Victoria Desert.

3. Coast Line.

- { 1. Indentations;
 - 1. Bays; 2. Gulfs.
- 2. Projections;
 - 1. Capes; 2. Peninsulas.
- 3. Straits; 4. Australian Bight.

4. Islands.

- 1. Tasmania; 2. New Zealand.

5. Rivers and Lakes.

- { 1. Rivers;
 - 1. Murray; 2. Darling.
- 2. Lakes;
 - 1. Gairdner; 2. Eyre.

6. Inhabitants.

- { 1. Races;
 - 1. Native;^{8, 10} 2. Foreign.
- 2. Languages; 3. Occupations.

7. Political Divisions.

- { 1. Positions; 2. Chief Cities;
- 3. Governments; 4. Resources;
- 5. Productions.

8. Climate.

- 1. Temperature; 2. Moisture.

9. History.¹³

- 1. Discovery; 2. Settlement.

SUPPLEMENTARY.

QUESTIONS.

1. In what season of the year does Christmas come in Australia?
2. Where is "Poison Valley?"
3. Relate some peculiarities of plants and animals found in Australia.
4. Where is the "Stony Desert?"
5. When it is Monday on Mindanao, it is Tuesday on Borneo; can you explain the reason for this?
6. What tree growing in Australia prevents malarial diseases?
7. What island has 50 active volcanoes?
8. How do the natives produce fire?
9. Name two beautiful birds found here.
10. How do the natives regard the white people?
11. For what are the natives of the Sandwich Islands noted?
12. What is a boomerang?
13. Give a brief history of Australia.

ANSWERS.

1. In Australia Christmas comes in summer; for, being in the southern hemisphere, its seasons are exactly the reverse of ours.

2. This valley is found on the Island of Java. It is filled with a deadly carbonic acid gas, which is fatal to all animal life. It is strewn with the skeletons of human beings and animals that have entered it and inhaled its deadly vapors. The natives have many superstitions concerning it, and never venture near it.

3. There are birds which have no feathers, and trees which have no leaves. An animal with the body of an otter and the bill of a duck is another of nature's freaks. Some trees shed their bark annually, instead of their leaves. There is a cherry which has the *stone on the outside*, and a bee that cannot sting.

4. The interior of the continent is so called because a great portion is covered by pebbles and fragmentary rocks.

5. The International Date Line passes between these islands. In traveling around the world *westward*, a day would be lost to our reckoning, and going *eastward* a day would be gained; hence it has been agreed that the day shall be changed when crossing this line. If going *west*, Monday, for instance, shall be changed to Tuesday; and, if going *east*, Tuesday must be changed to Monday. Strange as it may seem, according to this a person might begin the writing of a letter on Tuesday and finish it on Monday of the *same week*. In that case the person must cross the Date Line going east.

6. The eucalyptus tree absorbs malarial poisons, and has rendered some portions of the globe quite healthy which were once uninhabitable. It grows nearly as large as the "big trees" of California.

7. Sumatra.

8. They rub two dry sticks together with such energy that they ignite. They have contrived a sort of machine for this purpose.

9. The Lyre bird and bird of Paradise. These birds have a most beautiful plumage, but they do not sing.

10. They hold the white people in great reverence, and believe that they are the reanimated spirits of their own kindred and ancestors.

11. No savage race has ever so rapidly and willingly yielded to civilizing influences as they.

12. The boomerang is a wooden instrument shaped like a sword and bent into an elliptical form. The natives handle it with great skill, throwing it into the air and causing it to strike the ground in such a manner as to rebound to the thrower.

13. Australia was discovered by the Dutch in 1605, and by them it was called New Holland. After a time it passed into the hands of the English, who changed its name to that it now bears, and made a settlement upon it in the year 1788. At first it was used as a sort of a prison to which convicts were banished, as Russia banishes her prisoners to Siberia. But in 1851 gold was discovered, and people flocked thither from all parts of the world. At present it is making rapid progress, and will soon be an important factor in the commercial world.

LESSON XVI. ATLANTIC OCEAN.



MAP DRILL.

1. Name the currents indicated in the sketch. 2. Has the Atlantic a definite northern and southern limit? Ans. It has not; there is no *definite* limit to this or any other ocean. 3. Can you locate the maelstrom? 4. Which extends furthest north, Africa or Mexico? 5. What is remarkable about the opposite coast lines of this ocean? Ans. If the eastern and western continents were to approach each other, the projections of one would neatly fit into the indentations of the other.

TOPICAL OUTLINE.

1. Position.

- { 1. Boundaries;
- 2. Latitude and Longitude;
- 3. Extreme Limits.

2. Extent and Depth.

- { 1. Area; 2. Length; 3. Width;
- 4. Mean Depth; 5. Greatest Depth;²
- 6. Character of Bottom.^{8, 9}

3. Islands.

- { 1. Continental;
- 1. On Western Coast;
- 2. On Eastern Coast.
- { 2. Oceanic.

4. Currents.

- { 1. South Atlantic; 2. Equatorial;
- 3. Gulf Stream.¹⁰

5. Tides.

- { 1. Spring Tides; 2. Neap Tides;
- 3. Cause of Tides; 4. Effects.

6. Winds.

- 1. Trade Winds; 2. Calms; 3. Storms.⁶

7. Sargasso Sea.¹³

- 1. Extent; 2. Vegetation.

SUPPLEMENTARY.

QUESTIONS.

- 1. Why is the Atlantic ocean so called?
- 2. Where is the deepest point in the Atlantic?
- 3. What two points, on the opposite shores of the Atlantic, are nearest each other?
- 4. From what is kelp made?
- 5. For what is the Atlantic remarkable?
- 6. To what length does sea weed often grow?

7. From what do the islanders in the Sargasso sea make a salad?

8. Can you describe the valleys in the Atlantic?

9. What and where is the "great bank?"

10. How wide and deep is the gulf stream?

11. If a well-closed bottle were dropped into the ocean on the western coast of Africa, on the equator, where would it probably land?

12. What remarkable fresh water springs are found off the coast of Florida?

13. What famous sea is found in the Atlantic ocean?

14. What phenomenon occurs in the Bay of Fundy?

15. What are the trade winds?

16. In what part of this ocean are sponges found?

ANSWERS.

1. It was named from the beautiful island which tradition located in this ocean. Ancient historians called it "Atlantis."

2. The deepest part of the Atlantic is near the island of St. Thomas: here it is 27,365 feet deep.

3. Cape St. Rogue and Cape Palmas. The distance between these points is twenty-five hundred miles.

4. Kelp is made from a species of weed, which grows in the Sargasso sea, known as rock-weed.

5. The Atlantic ocean is the stormiest body of water on the globe. The hurricanes which sweep over the regions of the West Indies are so terrific that whole islands are sometimes desolated.

6. Some of the weeds in the Sargasso sea grow to the length of one thousand feet.

7. From a species of sea-weed.

8. The middle of the bottom of the Atlantic ocean is much elevated, and there is a fable that this portion was once above the surface. Between this plain and the continents are two deep and winding valleys.

9. This is a great sand bank southeast of Newfoundland. The water is from 100 to 500 feet deep. This is the greatest fishing region in the world, and cod fish, as well as seals, and even whales, are taken in great numbers.

10. It is about thirty miles wide, and two thousand feet deep, and has a velocity of five miles per hour. It carries a thousand times as much water as the Mississippi.

11. It would float in a westward direction toward the coast of South America; then north through the Caribbean sea, the Gulf of Mexico, and following a northeasterly direction would finally land upon the shores of Great Britain or Norway.

12. A few miles from the eastern shore, and nearly opposite Matanzas, a large volume of fresh water boils to the surface. Fishermen and sailors come to this spring and dip up fresh water in the midst of the briny ocean. Springs of a similar character are found off the western coast.

13. The Sargasso sea, or "sea of grass." A counter current causes the Gulf stream to send off a branch which completely encircles this so called sea. Since the waters in this part of the ocean have no progressive motion, it has become thickly filled with sea-weed. It was into this weedy part of the ocean that Columbus sailed on his first voyage, and after many times changing his course, succeeded in getting through it. Examine the line marking Columbus' first voyage, in any History.

14. On account of the peculiar funnel-shaped form of this bay, the tide sometimes rises to the enormous height of seventy feet. The tidal wave as it passes up the bay, becomes higher in proportion as it is shortened by the steep banks.

15. The heat of the torrid zone causes the winds to blow toward the equator. In their passage from the northern and southern regions, the winds are constantly approaching those parts of the earth where the rotation is more rapid. This causes them to be retarded in a westerly direction. Owing to their constancy they are called trade winds, —the word *trade* formerly meant *trail*. It was long thought that they received this name because of their commercial value, but this is now believed to be erroneous.

16. Sponges are found in large quantities in the Atlantic off the coast of Florida. The sponge, though it grows like a plant, is really an animal. The sponge of commerce is the *skeleton* of the animal, which in life is filled with a jelly-like substance.

LESSON XVII.

THE PACIFIC OCEAN.

[SKETCH and TOPICAL OUTLINE to be made by the pupil.]

SUPPLEMENTARY.

QUESTIONS.

1. Why is the Pacific ocean so called?
2. How much of the earth's surface does the Pacific cover?
3. What movement of waters is peculiar to this ocean?
4. What is called the great volcanic floor of the earth?
5. What is called the Mediterranean of the Pacific?
6. Why was the Pacific once called the South sea?
7. What is meant by a "spit" in the ocean?
8. Who first made known the existence of the Pacific?
9. Into what three divisions is Oceanica divided?
10. What two "seas" are found in the Pacific?
11. What is peculiar about the trade winds of this ocean?
12. What and where is the "ocean desert?"
13. What windstorms are peculiar to the Chinese sea?
14. What are monsoons?
15. What remarkable island is found in latitude 27° S., and longitude 107° W.?

ANSWERS.

1. The early navigators applied the name pacific (peaceful) on account of the tranquillity of its waters. While this name may, with propriety, apply to the general character of its surface, yet its waters near the coast of Asia are often violently agitated by storms.

2. It covers more than one-third of the earth's surface.

3. The Pacific, near the equator, has a perceptible current flowing from the east toward the west. This current is probably due to the influence of trade winds and the rotation of the earth.

4. The Pacific ocean, on account of its volcanoes.

5. This name is sometimes applied to Puget Sound.

6. Because Balboa, its discoverer, saw it toward the south.

7. An island which is covered by water when the tide rises is called a "spit."

8. Columbus was the first to make known to Europeans the existence of this ocean. He received accounts of it from the natives of America.

9. Oceanica, which comprises nearly all the islands of the Pacific, is divided into three portions: Australasia, Malaysia, and Polynesia

10. One lies about 15° from New Zealand in an easterly and southeasterly direction. The other about the same distance west of San Francisco. The latter is much the larger.

11. The trade-winds, in the greater part of the Pacific, are neutralized by the monsoons and other periodical winds. The meeting of these counter currents occasions frequent hurricanes, which, however, are not so violent as those found in the Atlantic.

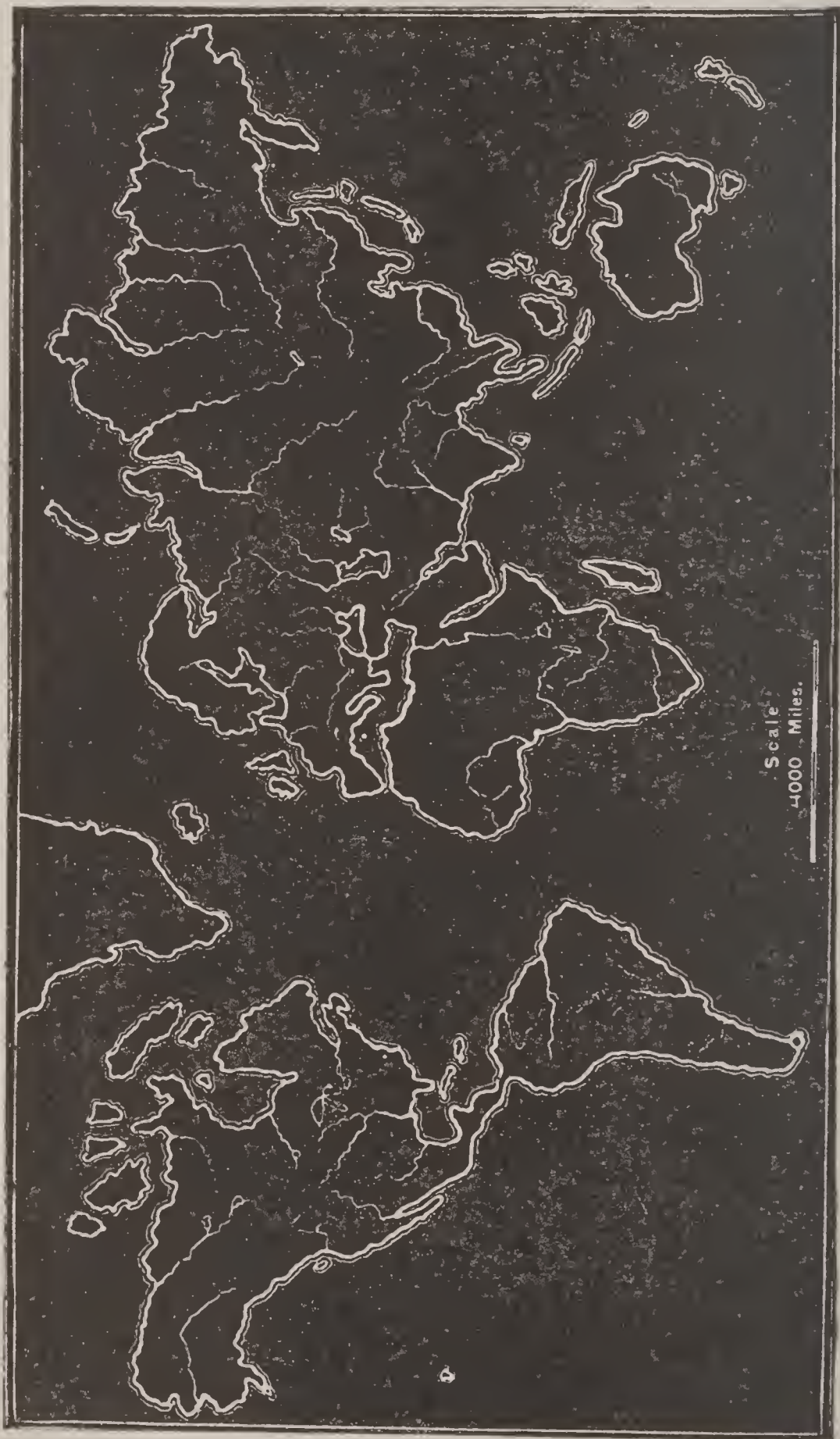
12. That part of the ocean lying between Cape Horn and New Zealand is almost wholly destitute of any signs of life. Neither is there any sign of life in the air. This whole region seems so much like the barren tracts of land that the name "Desert" has been applied to it by mariners.

13. The typhoon.

14. The monsoon is a wind which for six months in the year—from April to October—blows from the southwest, and from the opposite direction during the remainder of the year. It is found in the tropical part of the Pacific, but more especially in the Indian ocean.

15. Easter island, which rises 1,200 feet above the sea, and is of volcanic origin. On this island, multitudes of large stone statues, standing upon great platforms of gigantic masonry, are found. The present inhabitants have no tradition of the people who made these sculptures. Many scientists believe that a great continent, of which the Polynesian islands are the highest parts, once occupied this part of the ocean, and that these statues were made by its inhabitants.

LESSON XVIII.—MAP OF THE WORLD. (Mercator's Projection.)



TOPICAL OUTLINE.

1. The Land.

- { 1. Area; 2. Origin;²⁹
- { 3. Distribution;
 - { 1. Continents;
 - { 2. Grand Divisions;
 - { 3. Principal Islands.

2. The Water.

- { 1. Area; 2. Origin; 3. Composition;³⁰
- { 4. Distribution;
 - { 1. Oceans;
 - 1. Currents; 2. Sargosso Seas.
 - { 2. Seas and Gulfs;
 - { 3. Inland Waters;
 - 1. Rivers; 2. Lakes; 3. Seas.

3. The Atmosphere.

- { 1. Extent;³¹ 2. Composition;³¹
- { 3. Winds;
 - { 1. Regular Currents;
 - 1. Trades; 2. Calms; 3. Monsoons
 - { 2. Irregular Currents;
 - 1. Hurricanes; 2. Cyclones.

4. Inhabitants.

- { 1. Races;
- { 2. Physical Characteristics;
- { 3. Number and Distribution;
- { 4. Manner of Living;
- { 5. Languages and Religions.

5. Animals.

- { 1. Classes;
 - 1. Mammals; 2. Fishes; 3. Birds.
- { 2. Distribution and Uses;
- { 3. Domestic Animals;
 - 1. Origin; 2. Nativity;¹⁴ 3. Uses.

6. Minerals.

- { 1. Classes;
 - 1. Metals; 2. Stones; 3. Coal; 4. Oil
- { 2. Distribution and Uses.

SUPPLEMENTARY.

QUESTIONS.

1. How many languages are spoken in the world?
2. What are the death and birth rates of the world?
3. How may the points of the compass be determined with a watch?
4. What is the greatest distance the human voice has ever been heard?
5. What is the largest city in the world where it is winter in July?
6. What is the only walled city in America?
7. What state has the arc of a circle for its northern boundary?
8. Why are the Horse Latitudes so called?
9. What was the Year of Confusion?
10. What is the deepest river in the world?
11. What is sometimes called the refrigerator of the United States?
12. What and where is the water volcano?
13. What river's name is spelled with a single letter?
14. Of what countries are the following birds natives: the turkey, the Guinea-fowl, and the peacock?
15. What plant is a natural compass?
16. What does the name Rio de la Plata mean?
17. What is the highest peak in Europe?
18. Of which hemisphere are the following animals natives: the horse, the dog, the camel, the sheep, the ox?
19. How high is the tallest tree in the world?
20. Why is Venezuela so called?
21. What are the Seven Wonders of the World?
22. What name has been devised to designate the exact form of the earth?
23. What parts of the earth's surface are undergoing a change of level?
24. What has been called the Egypt of America?
25. What is the rainiest town on the globe?
26. Of what countries are the following plants natives: wheat, oats, rice, cotton, potato, cabbage, and corn?
27. Of what countries are the following fruits natives: apple, peach, pear, cherry, orange, pineapple, plum and fig?

28. Can you describe the earthquake which occurred in Canada in 1663?

29. How was the soil, or land, on the earth formed?

30. Of what is water composed?

31. What is the extent and composition of the atmosphere?

32. Potatoes cannot be cooked on the top of the Alps in an open vessel. Why?

ANSWERS.

1. There is considerable difference of opinions as to the number of original languages, since some dialects are so peculiar to themselves, that it is difficult to determine whether they are not really original languages. The best authorities distinguish 80 languages and 4,000 dialects.

2. It has been computed that the death rate is 67 per minute, and the birth rate 70 per minute. This seemingly small gain is sufficient to increase the world's population at the rate of over 1,000,000 a year.

3. Place the watch in such a position that the hour hand is directly toward the sun. South then lies midway between the hour it may happen to be and the numeral XII on the dial.

4. The sentinels' "All's Well" has been heard from Old to New Gibraltar, a distance of twelve miles. In the Arctic regions, it is reported, conversation has been carried on when the speakers were over a mile apart.

5. Buenos Ayres.

6. Quebec is the only city on this continent which is surrounded by a wall.

7. The northern boundary of Delaware is the arc of a true circle. A portion of Pennsylvania extends south to the place where this line is tangent to the Maryland line.

8. The Calms in the northern tropic are so-called, because, formerly, sail vessels loaded with horses were often delayed here, and were obliged to throw overboard a part of their cargo to save the rest from starvation.

9. In the year 1752, an error in the calendar amounting to 11 days was corrected. The year was also made to begin in January instead of March. This year was *shorter* than other years, and many persons, being unable to understand this, were much confused.

10. The Saguenay river, which is 3,000 feet deep at the mouth, is considered the deepest river in the world.

11. Alaska was so stigmatized by those who opposed its purchase.

12. In Guatemala, Central America. At times it sends forth from its northern side, torrents of cold water.

13. The Y, an important stream which flows through Amsterdam.

14. The turkey is a native of America; the Guinea-fowl, of Africa; and the peacock, of India.

15. The rosin-weed. Whenever it is found in unshaded ground, its leaves point North and South. It is found in the Western states.

16. Rio de la Plata is Spanish for "River of Silver."

17. Elbruz, in the Caucasus Mountains.

18. The horse is a native of the eastern hemisphere; the dog, of both; the camel, the sheep, and the ox, are natives of the eastern. Fossils found in the Yellowstone Park, indicate that a small species of the horse at one time lived upon the western continent.

19. One of the "Big Trees" in California is said to be 435 feet high.

20. When Ojeda, a Spanish navigator, explored the coast of Lake Maracaybo, he found the natives living in huts built on piles rising out of the water along the shore. Hence, he called the country *Venezuela* or *Little Venice*. (See Supplement of Europe, Question 20.)

21. 1. Pyramids of Egypt. 2. Hanging Gardens of Babylon. 3. Temple of Diana at Ephesus. Statue of Jupiter at Olympia. Mausoleum of Artemesia. 6. Colossus of Rhodes. 7. Pharos of Alexander.

22. Careful measurement has proved that the earth is not a perfect oblate spheroid. So the name "geoid" has been devised. This word means, simply, *earth-form* or *earth-like*, and is of no practical value.

23. Many parts of the earth's surface are slowly undergoing a change of level. The southern coast of Florida is sinking; the eastern coast of Greenland is sinking; the northern part of the Scandinavian peninsula is rising; and the bed of the Pacific ocean, near Australia, is sinking.

24. Mexico is so-called on account of the numerous ancient temples. These were built by the Aztec Indians, and their ancestors, before this great people was conquered by Cortez. The pyramid of Cholula covers 40 acres. There are several others which cover 10 acres each.

25. Sitka, in Alaska, is believed to have the greatest rainfall of any town in the world.

26. Wheat is a native of southern Asia ; oats, of Central Asia ; rice, of the East Indies ; cotton, of America, Asia, and Africa ; potatoes, of America ; cabbage, of Europe ; and corn (maize), of America.

27. The apple is probably a native of Europe, but this is not well established ; the peach is a native of Persia ; the pear, of Europe and Asia ; the cherry, of Europe ; the orange, of eastern Asia ; the pineapple, of tropical America ; the plum, of Europe ; and the fig, of Asia.

28. This earthquake was so violent that it changed the face of the country. Mountains arose from level plains, while large lakes disappeared entirely. At Three Rivers a mountain was thrown into the St. Lawrence and the river took a new course.

29. The crust which was formed on the earth, was, undoubtedly of solid rock. By the action of the water, the air, and other corroding agencies, much of this has been pulverized into what we call sand, or clay. Sand and clay when mixed with vegetable or animal matter, form *soil*.

30. Water is composed of two gases, oxygen and hydrogen, in the proportion of two parts of hydrogen to one of oxygen. They are in chemical union.

31. A layer of air, variously estimated at from 50 to 500 miles deep, surrounds the earth and presses down upon it with a force of 15 pounds to the square inch of surface at the level of the sea. It is composed of two gases, oxygen and nitrogen, in the proportion of four parts of nitrogen to one of oxygen. They are not in chemical union, but merely form a mixture.

32. On the summit of the Alps (or any high mountain) the pressure of the air is considerably less than 15 pounds to the square inch, and this causes water to boil and evaporate before it reaches the temperature necessary to cook potatoes. In a closed vessel they may be successfully cooked. See Franklin's experiment in any Natural Philosophy.

MISCELLANEOUS.

QUESTIONS.

1. What is the origin of the terms Latitude and Longitude?
2. Why are the days longer than the nights?
3. If it were possible to see what was transpiring on the earth (1897) from the North Star, what would we behold?
4. What river flowing into Hudson Bay empties a part of its waters at certain seasons of the year, into the Gulf of Mexico?
5. Could people on the moon converse with each other?
6. What is the largest empire in the world?
7. Is Denmark a peninsula?
8. In what direction is the entire Solar System moving?
9. What is meerschaum, and where is it found in the United States?
10. Does the axis of the earth point directly toward the North Star?
11. Why was Holland so called?
12. What remarkable buildings are found in Sardinia?
13. How is it possible to foretell eclipses of the sun and moon?
14. In the Western part of North Carolina there is an *independent republic*. Can you describe it?
15. How is the northern boundary of the United States marked?
16. What is the largest inland city in the world?
17. What and where is the Rock of Refuge?
18. What sea's name means "middle of the earth"?
19. What is the fleetest of all four-footed animals?
20. Why are the tropics and polar circles placed where they are?
21. What are the chief influences of climate on the human race?
22. Where are the gates of the Rocky Mountains?

23. What is a wady?
24. Where does the most indestructible wood in the world grow?
25. Is the magnetic pole stationary?
26. For what is the month of February, 1886, memorable.
27. What is the Nebular Hypothesis?
28. Whence is lead pencil wood obtained?
29. Which of the North American rivers carries the largest volume of water to the sea?
30. What remarkable geological formation has been discovered in the state of Kansas?
31. What is disturbing the equilibrium of the earth?
32. Why is the ecliptic so called?
33. How long would it take an express train at its highest speed to travel from the earth to the sun?
34. What and where is the thermal equator?
35. How fast is the earth travelling in her path around the sun?
36. What would a pound weigh if carried to the different planets?
37. Does the Mississippi flow "*up hill?*"
38. Allowing $1\frac{1}{2}$ acres of land for each inhabitant, how large a territory would be required for the whole population of the world?
39. Allowing four square feet for each person, how much land would be required for standing room for the world's inhabitants?

ANSWERS.

1. The Ancients believed the earth to be an immense plain, longest from east to west, hence distances measured in that direction were called Longitude, which means length. Distances measured north and south, were called Latitude, which means width.

This idea arose from the fact that the Ancients were only acquainted with that part of the world bordering on the Mediterranean, the greatest extent of which is east and west.

2. When a ray of light passes from a rarer to a denser medium, as from the ether into the air, or from the air into the water, it is refracted towards *the perpendicular*. The sun is never seen, in our latitude, where he really is, but always a little higher than his true position. This refraction is greatest when the sun is near the horizon. Owing to this phenomenon, we see the sun *before it rises*, and *after it sets*. The days are about eight minutes longer than the nights.

3. It is estimated that it requires 49 years for light to travel from the earth to Polaris. Hence, if we could see the earth's surface from that far off star, we would behold the close of the Mexican war in the United States; the chartist troubles in England; the abdication of Louis Philippe, and the agitation of entire Europe.

4. The Red River of the North. The source of this river is on the divide between the river systems of the Gulf of Mexico and Hudson Bay. When the rainfall is heavy, the river flows in both directions. The southern stream reaches the Mississippi.

5. They could not. There is no air upon the moon, and therefore no sound is possible. The firing of a cannon would produce absolutely no sound there.

6. Great Britain is the largest empire in the world. It comprises more than one-sixth of the entire land surface of the globe.

7. Denmark is now an island. A large ship canal has been cut through the neck of what was once a peninsula, thus severing Denmark from the mainland.

8. The sun, with all the planets, is supposed to be moving *toward* the constellation Hercules, and *around* the Pleiades as a center. The direction of this motion is highly probable, since the stars in Hercules are receding from each other, occasioned by our nearer approach, while those in the opposite direction are approaching each other. But whether Pleiades is our center is rather a conjecture.

9. Deposits of meerschaum are found in New Mexico on Sapello creek near the Alum deposits on the Gila river. The principal vein is eight inches in width.

Meerschaum is used in the manufacture of pipes.

10. It does not, but pierces the Celestial Sphere about a degree and a half from the North star on the side of the Great Dipper.

11. Holland is a corruption of the phrase, *hollow land*, applied to it because the greater part of its surface is below sea level.

12. More than 3,000 prehistoric buildings have been found in Sardinia. They are built in groups in the fertile portions of the island.

13. The moon changes her path around the earth, with reference to the sun, in such a manner as to come into the same relative position in about 18 years. This is called a lunar cycle. The eclipses in one cycle occur exactly in the same order as those of the preceding cycle. Hence, if a record be kept of eclipses for one cycle, it will serve for all future cycles.

14. "In the western part of North Carolina is a perfectly organized republic independent of both state and national governments. It is known as the Qualla Reserve, and is the home of about 1,000 of the Cherokee Indians belonging to the eastern branch. The Reserve has an area of 50,000 acres, or 82 square miles, of the richest valley land of the state, lying along the Ocona, Lufta, and Soco creeks. The President of the little republic is elected every four years. He receives a salary of \$500 a year, but when at Washington on business for the republic he gets \$4 a day extra. He is called Chief, and none but a Cherokee of more than thirty-five years is eligible to the chieftainship. When he is absent his duties are performed by an Assistant Chief, whose salary is \$250 a year. The Chief has a cabinet of three secretaries, and the congress comprises two delegates from every 100 members of the tribe. All Cherokee males of sixteen and all white men who have Indian wives have the right to vote. The constitution provides for the maintenance of a public school, in which both English and Cherokee are taught. The inhabitants of the Reserve are intelligent, fairly well educated, law-abiding, and industrious."

15. The northern boundary, which was run on the 49th parallel, extends from Lake of the Woods to a point in the Gulf of Georgia. It is marked by mounds of earth, heaps of stones, wooden posts, and cast-iron pillars. The pillars are set one mile apart.

16. Indianapolis. The river upon which it is situated is not navigable.

17. In Hawaii there is a rock known by this name. Criminals who reach this rock are safe while they remain there.

18. The word *Mediterranean* is an adjective formed from two Latin words meaning "middle of the earth."

19. The Antelope.

20. The earth's axis is inclined $23\frac{1}{2}^{\circ}$ to the plane of the ecliptic. At the summer solstice, the sun's perpendicular rays would trace the northern tropic; at the winter solstice, they would trace the southern tropic. Beyond these lines, the sun never comes in the zenith. Again, at the winter solstice, the sun's rays reach only to the Arctic circle, and the entire north pole regions are in darkness; at the summer solstice, the same thing occurs in the south polar regions. Hence, the polar circles are the limits of the sun's *extreme* rays.

21. Extremes of heat and cold produce languor. In accordance with this, we find the natives of the equatorial and of the far northern regions a sluggish people. The people of the temperate zone are much more active both mentally and physically. It is for this reason that civilization has made its greatest progress in temperate climates.

22. Near Helena, Montana, the Rocky mountains are cut by deep passes, which have been styled the gates of the the Rocky mountains.

23. A dry river bed is called a wady. Many of these are found in the desert of Sahara.

24. The Jarrah wood of western Australia seems to defy all forms of decay, and is not attacked by insects. For this reason, it is much in demand for ship-building. Its supply, however, is not great.

25. The magnetic pole, for a period of 11.11 years, moves toward the west; then during a like period it swings back to the east. This oscillation traces a path across the northern part of Hudson Bay. It is a singular fact that spots on the sun increase and decrease their number in the same length of time. Other meteorological phenomena are apparent. The dykes of Holland are damaged by the ocean billows at the recurrence of this same period.

26. This month had no full moon. This is the first instance of the kind in the history of man. According to astronomical calculations it will not occur again for 2,500,000 years.

27. It is a theory advanced by Laplace, a French astronomer, that the material of which the solar system is composed, was scattered through space in a gaseous vapor called nebula. Granted that this matter began to accumulate around a center, and that it acquired a rotary motion, it can be shown on strictly mechanical principles that a system resembling our own might be formed.

28. All the wood (soft cedar) used in the manufacture of lead pencils comes from Florida. In a few years, the supply of this wood will have been so diminished that it will be difficult to meet the demand.

29. It is estimated that the Yukon carries more water to the sea than any other river of North America. In the region drained by this river, it rains or snows almost continually. During the summer season, nearly all the snow, which falls in the winter, melts; and this, together with the amount of rain which falls, produces a volume of water scarcely equaled by any other river in the world.

30. A large part of Kansas seems to be over an underground sea, portions of which have been discovered in various parts of the state. A somewhat similar formation exists in the state of Kentucky where many bodies of water, and also running streams, have been found.

31. Owing to the fact that in the southern hemisphere the winter is longer than the summer (see question 10, page 6) an immense ice cap is forming in the Antarctic region which is causing the center of gravity of the earth to move farther south. Many thousand centuries ago an ice cap formed in the northern hemisphere to such an extent that it covered even the northern portions of the United States to a depth of several hundred feet. This is known in Geology as the glacial period, a discussion of which is intensely interesting. Lack of space forbids our entering upon it here.

32. The moon in order to cause an eclipse, or be itself eclipsed, must come into this plane. Hence, the name *ecliptic* was applied to it.

33. It would require about 200 years.

34. The thermal equator is a line connecting points of highest temperatures. It runs mainly north of the mathematical equator, but is deflected north and south by currents of air and water.

35. The earth in her orbit, speeds along at the rate of $18\frac{1}{2}$ miles per second. This rate is quite inconceivable when we find that it is about 60 times as fast as the speed of a rifle bullet.

36. A mass weighing a pound on the surface of the earth, would weigh about $7\frac{1}{2}$ ounces on Mercury ; 14 ounces on Venus ; 6 ounces on Mars ; $2\frac{1}{2}$ pounds on Jupiter ; 17 ounces on Saturn ; 14 ounces on Uranus ; and 13 ounces on Neptune.

37. The earth's equatorial diameter is 26 miles greater than the polar diameter. Since the Mississippi flows south, its mouth is computed to be about two miles farther from the earth's center than the source ; hence, we may say that it flows "*up hill*." According to the water-level or the plumb-line, it flows "*down hill*," as both of these instruments are affected by the earth's rotary motion. If the earth were to cease rotating the Mississippi's water would flow toward its source, and the waters of the equatorial regions would recede to the poles.

38. If the whole population of the earth was placed in the United States there would be $1\frac{1}{2}$ acres for each person.

39. All the people in the world could stand on five and one-half townships, and each individual would have four square feet of standing room.

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